

**CANADA**  
**DEPARTMENT OF NORTHERN AFFAIRS AND**  
**NATIONAL RESOURCES**

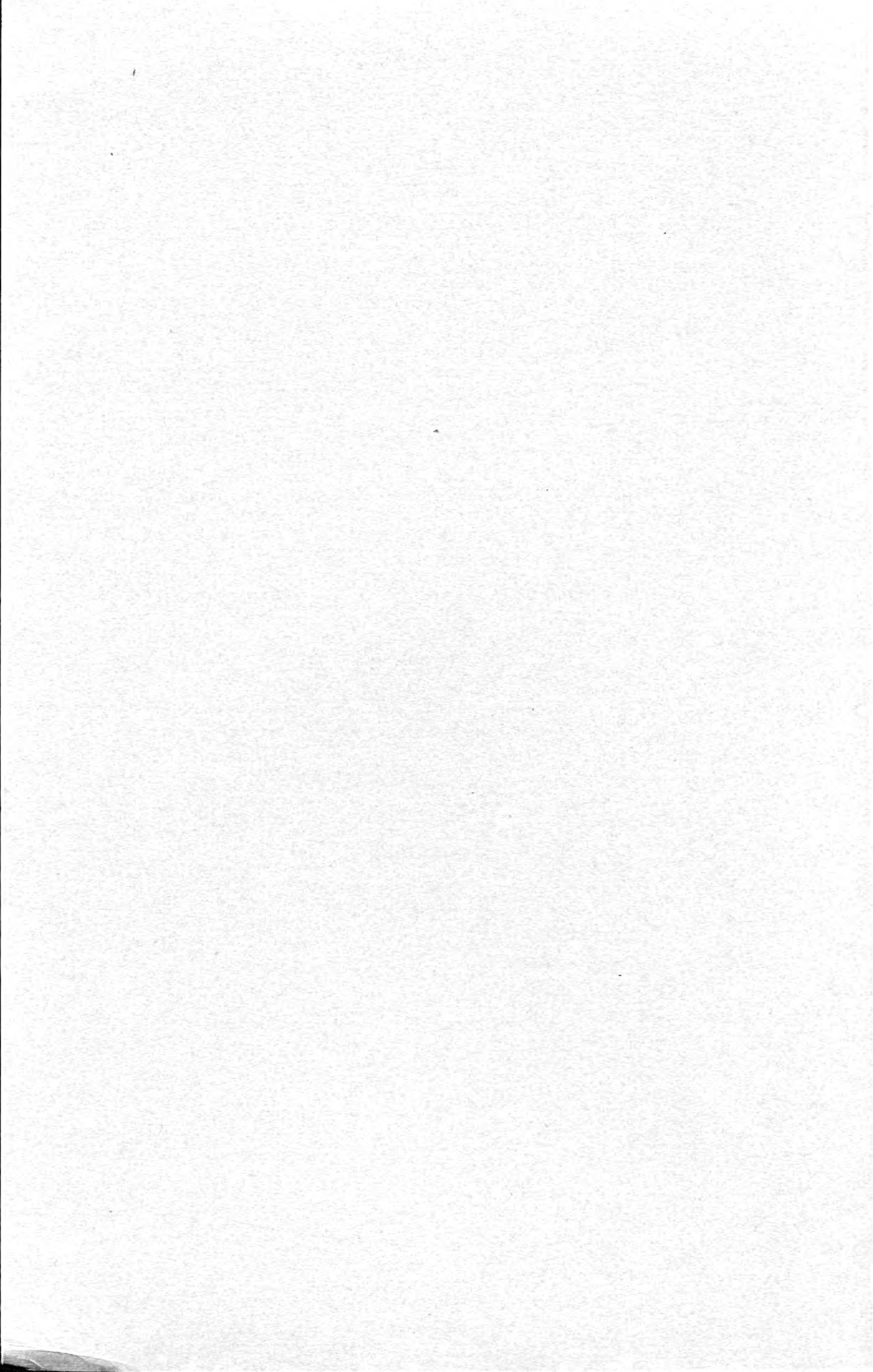
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**National Museum of Canada**  
**Bulletin No. 142**

**ANNUAL REPORT OF THE**  
**NATIONAL MUSEUM OF CANADA**  
**FOR THE FISCAL YEAR 1954-55**

**1956**

*Price: \$1.50*





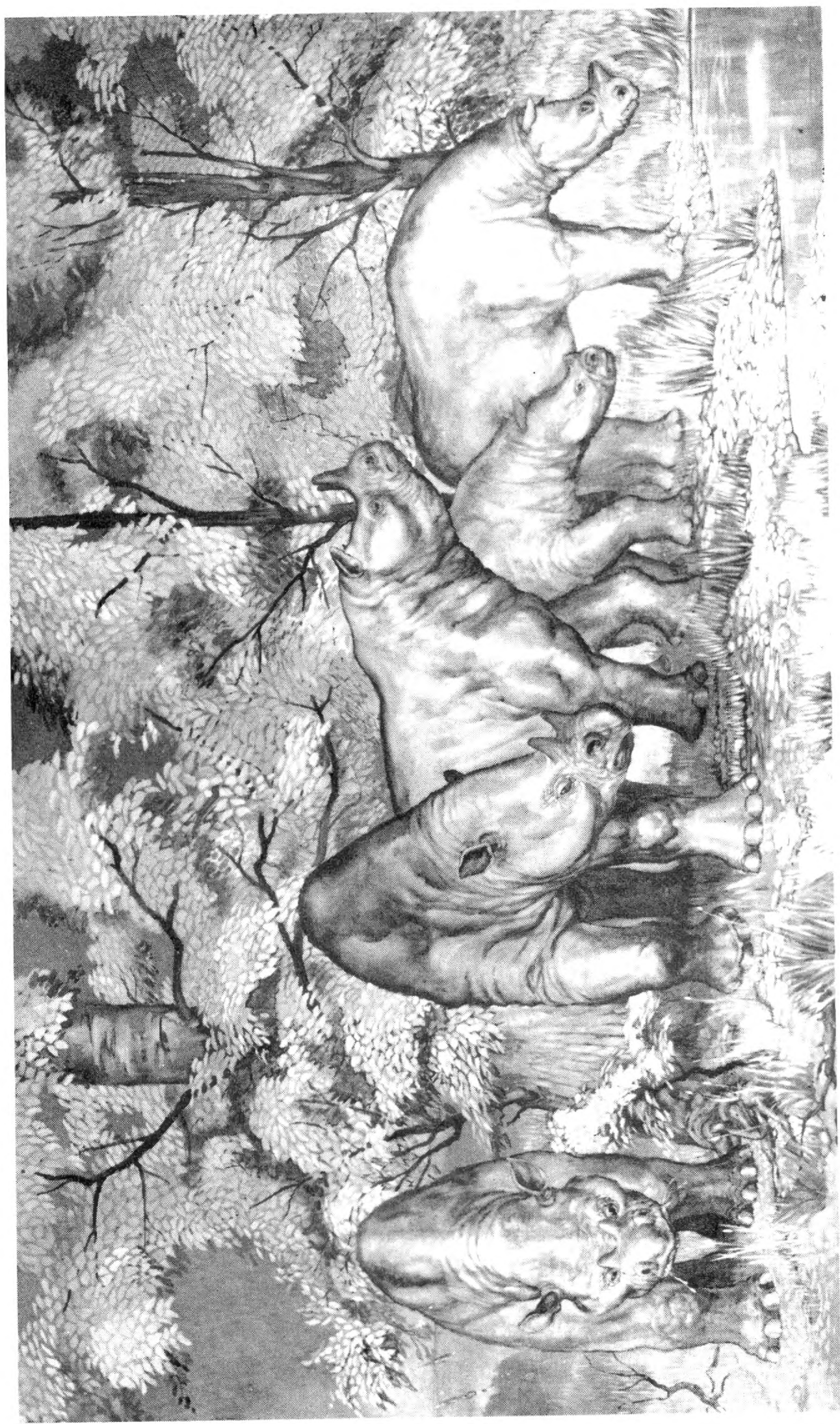












Titanotheres mural at National Museum, Canada.



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DEPARTMENT OF NORTHERN AFFAIRS  
AND NATIONAL RESOURCES

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NATIONAL PARKS BRANCH  
NATIONAL MUSEUM OF CANADA

ANNUAL REPORT OF THE  
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The Minister of Northern Affairs and National Resources  
Ottawa  
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## FOREWORD

The National Museum of Canada may be said to date from 1841 when at the first session of the first United Parliament of Upper and Lower Canada an Act was passed voting money to establish a Geological Survey. In the following year William E. Logan was appointed to undertake the work. His duties, as designated in the Act, were to collect full and scientific descriptions of the country's rocks, soils, and minerals; to prepare maps, diagrams, and drawings; and to collect specimens to illustrate the occurrences.

Under Logan's direction much was accomplished. He built up a staff and collected so many specimens that the offices had to be moved several times to more commodious quarters. On more than one occasion he took abroad large museum collections which won numerous awards at expositions.

When Confederation came and the Maritime Provinces and the vast regions of the West became part of Canada, a new responsibility was thrown on the Survey since it was the only government organization to explore the resources of the newly-added territory. Under the second Director, A. R. C. Selwyn, additional field officers were recruited, and these were expected not only to study the geology of the areas assigned them but also to report on the fauna, flora, forests, waterpower, and native races. In 1880, the offices and specimens were moved from Montreal to Ottawa.

In 1910, under Director R. W. Brock, the Geological Survey moved from its quarters on Sussex Street to the new Victoria Memorial Museum building. Here with more space available for exhibits the Museum functions of the Survey had an opportunity to expand. Recognizing that his field officers could not be expected to be specialists in all the fields of natural science, Brock added to his staff palæontologists, zoologists, botanists, ethnologists, and archæologists, besides museum preparators, taxidermists, and technicians.

In 1920 the Geological Survey was divided into two branches. Its Director, Wm. McInnes, then became director of one branch, the Victoria Memorial Museum, and W. H. Collins was made director of the other, which retained the name, Geological Survey. Following Dr. McInnes' death Dr. Collins became Acting Director of the Museum, though he still retained his directorship of the Survey. In 1927 the Museum was given the name "National Museum of Canada".

When the former Department of Mines and Resources was divided into three departments in 1950, the Geological Survey was made part of the new Department of Mines and Technical Surveys, and the National Museum part of the Department of Resources and Development, now known as the Department of Northern Affairs and National Resources. The Survey and the Museum, both still housed mostly in the same building, continue to share such services as library and storage, as well as photographic and mechanical services. The separation will be complete only when the Geological Survey moves into a building of its own; plans for this move are well advanced.

F. J. ALCOCK,  
*Chief Curator.*





## CONTENTS

	PAGE
General activities of the National Museum of Canada, by F. J. Alcock.....	1
Summary of archæological investigations in southeastern Manitoba, by Richard S. MacNeish.....	25
Archæological reconnaissance of the delta of the Mackenzie River and Yukon Coast, by Richard S. MacNeish.....	46
Archæological investigations on Southampton and Coats islands, N.W.T., by Henry B. Collins.....	82
Notes sur l'urbanisation d'une communauté Québécoise, par Marcel Rioux.....	114
La Pêche en Gaspésie (technologie et terminologie), par Carmen Roy.....	121
Studies on the shore Crustacea collected in eastern Nova Scotia and Newfoundland, 1954, by E. L. Bousfield.....	127
Additional occurrences of fossil horse remains in western Canada, by Loris S. Russell	153
The shell of <i>Basilemys variolosa</i> (Cope), by Wann Langston, Jr.....	155
Bibliography of Canadian anthropology for 1954, by T. F. McIlwraith.....	166

## Illustrations

Titanothere mural at National Museum, Ottawa.....		Frontispiece
Summary of archæological investigations in southeastern Manitoba, by Richard S. MacNeish		
Figure	1. Map showing position of sites.....	26
	2. Diagnostic artifact types in the sequential foci of southeast Manitoba.....	28
Archæological reconnaissance of the delta of the Mackenzie River and Yukon Coast, by Richard S. MacNeish		
Plate	I. Pot of Thule-tempered ware.....	71
	II. Examples of Mackenzie Stamp Ware, Firth River Ware, and Thule Grit- and Fiber-tempered Ware.....	73
	III. Various artifacts.....	75
	IV. Bladelettes, burins, end-scrapers, and other artifacts.....	77
	V. Arrow points and other artifacts.....	79
	VI. Blades, handles, and other artifacts.....	81
Figure	1. Map showing location of sites in the Mackenzie Delta-Yukon coast region.....	47
	2. Rim profiles. Interior of vessels to the right.....	52
Figure	3. A, Contour map of house 1. B, Roof beams of house 1. C, Floor plan of house 1. D, Outlines of house types.....	65

Archæological investigations on Southampton and Coats islands, N.W.T., by  
Henry B. Collins.

Plate	I-A. House 30, Sadlermiut site, Native Point. Mammal bones in foreground.....	91
	B. View of T1, the Dorset culture site on 85-ft. elev., Native Point. Four of the squares of Midden 1 are shown during excavation	91
	II-IV. Various artifacts found.....	93-97
	V. Chert projectile points.....	99
	VI. Chert blades and scrapers.....	101
	VII. Various chert artifacts.....	103
	VIII. Various scrapers and implements.....	105
	IX,X. Lamellar flakes.....	107-109
	XI. Chert blades.....	111
	XII. Various artifacts.....	113

Studies on the shore Crustacea collected in eastern Nova Scotia and Newfoundland,  
by E. L. Bousfield.

Figure	1. Collecting localities in Newfoundland and eastern Nova Scotia.....	132
	The shell of <i>Basilemys variatosa</i> (Cope), by Wann Langston, Jr.	
Plate	I. <i>Basilemys variatosa</i> (Cope). Carapace and plastron as mounted....	164
	II. <i>Basilemys variatosa</i> (Cope). Lateral view of reconstructed shell and detail of sculpture.....	165
Figure	1. <i>Basilemys variatosa</i> (Cope). Carapace as reconstructed in mounted specimen.....	157
	2. Shells of <i>Basilemys</i> : A, <i>B. variatosa</i> (Cope); B, <i>B. sinuosa</i> Riggs; C, <i>B. nobilis</i> Hay.....	160-161

## GENERAL ACTIVITIES OF THE NATIONAL MUSEUM OF CANADA

*By F. J. Alcock, Chief Curator*

The functions of the National Museum are to collect and serve as a repository for Canadian anthropological and natural history material of scientific or economic interest; to conduct studies in connection with the material collected and related subjects; and to provide and disseminate information, both technical and general, regarding natural science and ethnology, by means of exhibits, publications, lectures, and photographs.

Twenty-two field projects were undertaken during the summer season. Of these, fifteen were by full-time members of the Museum staff, two by part-time members, and five were carried out by workers who were only partly financed by Museum funds. The projects covered palæontological studies in Alberta and British Columbia; and the following investigations: birds in Cape Breton Island, Nova Scotia, and Quebec; mammals in Prince Edward Island; and amphibians and reptiles in Ontario and Quebec. Studies on certain invertebrate forms were continued on the lower St. Lawrence River region, and general zoological studies were made in the Arctic at Isachsen. Field studies on the botany of the Clay Belt of Northern Ontario and Quebec were completed. Archæological studies on Indian sites were made in Ontario and British Columbia, and on Eskimo sites in the Northwest Territories and the Yukon. Ethnological investigations, including the collection of folk songs and folklore were carried out in Nova Scotia, New Brunswick, and Quebec, and in the Prairie Provinces and British Columbia. A great amount of new material was collected for study and for exhibition purposes. Other material was obtained by gift and purchase.

Four National Museum bulletins were issued during the year; six others were prepared and edited; manuscripts are ready for five more, and work is well advanced on still others. Numerous papers and reviews for journals were prepared by members of the scientific staff.

Exhibits were improved during the year. Two large murals, one of moose and the other of barren ground caribou, were completed.

During the year the Museum lost by resignation the services of Kenneth H. Peacock, Musicologist, and Dr. Douglas Leechman, Senior Archæologist; and by superannuation those of Miss M. W. Godwin, Assistant in Education. New additions to the staff include Dr. Howard A. Crum, Cryptogamic Botanist; Dr. Wann Langston, Vertebrate Palæontologist; and Miss Joan T. Kembar, Junior Anthropologist.

The present Annual Report embodies a special feature, a bibliography of Canadian anthropology, archæology, and ethnology for the calendar year 1954. Previous bibliographies of this kind were published in the Canadian Historical Review. The first compiler was Dr. Diamond Jenness, former chief of the Division of Anthropology at the National Museum. Since 1925 these annual bibliographies have been prepared by Professor T. F. McIlwraith, Head of the Department of Anthropology at the University of Toronto. Future bibliographies of this series will continue to be published in the Annual Reports of the National Museum.

## EDUCATIONAL SERVICES

The National Museum is a storehouse of information on the natural history of Canada, and on the Eskimo and Indian peoples and their way of life. To make this information available to the public is the primary purpose of the Education Section. This end is achieved through the display material in the exhibition halls; through lectures, publications, photographs, film strips, correspondence; and by the loan of visual aids such as motion pictures, dioramas, and specimens of birds and mammals and of Indian and Eskimo material. Much information is distributed through these media to teachers, students, and to the public. In addition, the study collections of the Museum are made available to scientists and advanced students carrying on research in natural history and anthropology.

### National Museum Lectures

#### *Adult Lectures in English*

The Wednesday evening lectures given during the autumn and winter months at the National Museum have become a tradition. The lecture Committee responsible for arrangements consisted of F. J. Alcock, Chairman; W. K. W. Baldwin, W. E. Godfrey, M. F. Goudge, J. F. Henderson, M. Rioux, H. J. Scoggan, and Mrs. S. D. MacDonald, Secretary. The lectures given covered a wide range of subjects.

*Man With A Thousand Hands*—a motion picture, introduced by I. S. Decarie, Director of Information, Aluminum Company of Canada, Montreal, Quebec.

*And There Was No Night*, by Neil Douglas, Travelogue-Lecturer, Meriden, Conn., U.S.A.

*The Barren Ground Caribou*, by A. W. F. Banfield, M.A., Ph.D., Canadian Wildlife Service, Ottawa.

*80,000,000 Indonesians Seek a Better Living*, by Nathan Keyfitz, B.A., Ph.D., Dominion Bureau of Statistics, Ottawa.

*Science in the Wheat Fields*, by C. H. Goulden, B.S.A., M.S.A., Ph.D., Department of Agriculture, Ottawa.

*Natural Gas for Canada*, by G. S. Hume, O.B.E., Ph.D., Department of Mines and Technical Surveys, Ottawa.

*The Walls of Jericho*, by A. D. Tushingham, B.D., Ph.D., Queen's Theological College, Kingston, Ontario.

*The Tropical Seas*, by T. W. M. Cameron, M.A., Ph.D., D.Sc., MacDonald College of McGill University, Ste. Anne de Bellevue, Quebec.

*Colonial Williamsburg*—a motion picture program shown through the courtesy of the Embassy of the United States of America, Ottawa.

*Rambles in England in Coronation Year*, by J. A. Gibson, M.A., B.Litt., D.Phil., Carleton College, Ottawa.

*Here and There in Canada's Eastern Arctic*, by R. G. Blackadar, M.A., Ph.D., Geological Survey of Canada, Ottawa.

*The Canadian Scene in Film*, by A. W. Trueman, M.A., D.Litt., LL.D., National Film Board, Ottawa.

*Wildlife of the Canadian Rockies*, by I. McTaggart Cowan, B.A., Ph.D., University of British Columbia, Vancouver, B.C.

*All About Switzerland*, by His Excellency, Dr. Victor Nef, Minister of Switzerland to Canada, Ottawa.

*The Story of the Horse*, by L. S. Russell, M.A., Ph.D., National Museum of Canada, Ottawa.

*Ancient Foods in Modern Mouths*, by R. S. MacNeish, M.A., Ph.D., National Museum of Canada, Ottawa.



### **Adult Lectures in French**

A series of lectures in French was presented this season for the first time—a new feature of the Museum's program of free public lectures. Three lectures were given on Thursday evenings, to rather small audiences (65, 125, 175 respectively). It is proposed, if attendance warrants it, to develop a Thursday evening French series to parallel the Wednesday evening series in English.

*Avec les Indiens forestiers dans le Québec subarctique*, by Jacques Rousseau, D.Sc., Director, Montreal Botanical Garden, Montreal, Que.

*Les Iroquois: Leur Passé, Leur Présent*, by Marcel Rioux, M.A., National Museum of Canada, Ottawa.

*La Birmanie, vue par un Canadien*, by Robert Gauthier, B.A., D.Paed., Ontario Department of Education, Toronto.

### **Children's Lectures**

Since 1912, the Museum has been presenting a program of lectures and motion pictures for children from 7 to 12 years of age, on Saturday mornings, during the autumn and winter seasons. This year the series consisted of the following topics:

*The Enchanted Forest*—motion picture.

*Trail Across the Arctic*, by R. G. Blackadar, M.A., Ph.D., Geological Survey of Canada, Ottawa.

*Digging Up the Past*, by T. E. Lee, B.A., National Museum of Canada, Ottawa.

*Northwest Passage*—motion picture.

*Angotée; Realm of the Wild*—motion pictures.

*Animals of All Countries*, by T. W. M. Cameron, M.A., Ph.D., D.Sc., MacDonald College of McGill University, Ste. Anne de Bellevue, Quebec.

*Animal Life in the Arctic*, by S. D. MacDonald, National Museum of Canada, Ottawa.

*How to be an Eskimo Artist*, by James Houston, Department of Northern Affairs and National Resources, Ottawa.

*A Geologist in the Bahamas*, by D. J. MacLaren, Ph.D., Geological Survey of Canada, Ottawa.

*How to Climb Mountains*, by John Wheeler, B.Sc., Geological Survey of Canada, Ottawa.

*Living Fossils*, by H. H. J. Nesbitt, M.A., Ph.D., D.Sc., Carleton College, Ottawa.

*Spring Wild Flowers*, by W. K. W. Baldwin, M.A., National Museum of Canada, Ottawa.

*Skiing in the Valley of the Saints; Maple Sugar Time; Ti-Jean Goes Lumbering; Bronco Busters*—motion pictures.

*Bush Christmas*—motion picture.

*Our Debt to Different Peoples of Long Ago*, by R. S. MacNeish, M.A., Ph.D., National Museum of Canada, Ottawa.

### **Group Visits**

Most of the visitors to the Museum came to see the material in the exhibition halls. Many children, from primary to high school age, came in organized groups, accompanied by their teachers, to study the specimens as a supplement to their lessons in social studies and in natural science. Guided tours were provided for many groups from Ottawa and vicinity, and from other centres such as Arnprior, Avonmore, Belleville, Berwick,

Brantford, Caledonia, Castleton, Cobden, Cornwall, Finch, Fort Erie, Gananoque, Guelph, Hamilton, Ilderton, Kenmore, Kingston, Montreal, Oshawa, Port Credit, Prescott, St. Catharines, Simcoe, Sutton, Trenton, Toronto; Lisbon, N.Y., and Syracuse, N.Y.

Some groups came from farther afield: a large group of selected senior high school students from across Canada, brought to Ottawa by the Rotary Club's "Adventure in Citizenship"; a very large group of Canadian Indians from the western provinces and Yukon Territory; a group of senior school-boys from the United Kingdom touring Eastern Canada; and a number of delegates from Asia, Europe, and America, attending the International Conference of Social Workers held in Toronto.

### Lecture Hall

As in previous years, the Lecture Hall of the Museum was made available to scientific and educational organizations, who presented to the public a rich and varied fare of lectures and films. The following are some of the groups who used the Lecture Hall for their programs: Geological Survey of Canada, Scientific Film Society, Royal Astronomical Society of Canada, Canadian Geographical Society, National Gallery of Canada, Ottawa Fish and Game Association, United Nations Association, Chemical Institute of Canada, Canadian Political Science Association, and various diplomatic groups.

During July and August a series of films, "Canada in Colour", was presented, in cooperation with the National Film Board, for summer visitors. These motion picture programs were held every afternoon, Monday through Friday, from 3 to 4 p.m. in the Lecture Hall.

### Television

This year people across Canada, far removed from Ottawa, visited the Museum for the first time through the medium of television. The CBC program, "Let's Go to the Museum", produced by Miss Marion Dunn, originated from the Museum's exhibition halls each Tuesday from 5 to 5:30 p.m., for a 26-week period from September 28 to March 29.

The program dealt with every phase of Museum activity: anthropology, archæology, botany, and zoology; and introduced many members of the Museum staff who discussed their particular scientific fields.

*Let's Go to the Museum*—introduction.

*Totem Pole People*—Dr. Leechman.

*Monsters of the Past*—Dr. Russell.

*Birds of Canada*—Mr. Godfrey.

*The Plant Kingdom*—Dr. Scoggan Mr. Baldwin, Dr. Crum.

*A Trip to Arctic Canada*—Mr. James Houston, Department of Northern Affairs and National Resources.

*Digging Up the Past*—Dr. MacNeish.

*Exploring the North*—Dr. R. G. Blackadar, Geological Survey of Canada.

*Macoun Field Club*—General Meeting.

*Folk Music in Canada*—Dr. Marius Barbeau.

*Ancient Foods in Modern Mouths*—Dr. MacNeish, Mr. Baldwin.

*A Look at Insects*—Members of Division of Entomology, Department of Agriculture.

*Mineral Matters*—Dr. E. Poitevin, Dr. J. A. Maxwell, Geological Survey of Canada.

*Anybody Home* (native dwellings)—Dr. Leechman.  
*Indians of the Prairies*—Dr. Leechman.  
*All Aboard* (native transportation)—Dr. Leechman.  
*Collecting Old Bones*—Dr. Russell.  
*A Bit About Mammals*—Mr. Cameron.  
*Making Animal Exhibits*—Dr. Russell, Mr. Godfrey, Mr. Crosby, Mr. MacDonald.  
*Macoun Field Club*—Exhibit Meeting.  
*Ontario, 10,000 B.C.*—Mr. Lee.  
*Seashore Animals*—Dr. Bousfield.  
*The Early Bird*—Mr. Godfrey.  
*The Loon's Necklace*—Dr. Leechman.  
*Let's Go to the Museum*—Conclusion.

## Photographs

Material from the Museum's photographic library was in great demand for use as illustrations in text-books, scientific publications, and magazine articles, and for study purposes. Photographs on anthropological, biological, and palæontological subjects were supplied in response to requests from all parts of Canada, and from the United States, the United Kingdom, and a number of European countries.

## Visual Aids

The Museum made available to other museums and educational institutions its collection of visual aids: films, lantern slides, mounted specimens of birds and mammals, dioramas, and specimens of Indian and Eskimo material. Upon request, collections were sent on loan to teachers in many parts of the country. This material is lent free of charge, except for the payment of transportation charges one way.

## ARCHÆOLOGY

### Field Work

Dr. Douglas Leechman left Ottawa late in May. He proceeded to Golden, British Columbia, where an important archæological site, hitherto unrecorded, was found at a considerable elevation above the river level. Crudely flaked specimens in reddish quartzite, and chips and flakes were found but no complete artifacts. This site deserves further examination. In the vicinity of Columbia Lake some pictographs, first described about fifty years ago, were examined. Weathering was found to be extensive. A small archæological site on an old lake terrace at the southwest corner of Columbia Lake yielded a fragment of Indian pottery, the first such find to be made in British Columbia. It is probably of Kootenay origin and strengthens our belief that these people originally lived on the prairies, east of the Rocky Mountains.

The new Hart Highway, from Dawson Creek to Prince George, permitted access to an area in which archæological work had not previously been done, and sites were discovered both east and west of the mountains but none in the mountains themselves. It is probable that this sterile area was glaciated until comparatively recently and has never been occupied by native people. Working south from Prince George, through Quesnel, down to Ashcroft, a number of new sites were discovered, some of them

amazingly rich in chips and flakes of black volcanic tuff. In the Quesnel area, sites were found on low shores of small lakes, away from the large rivers, and in the southern part of the area between Ashcroft and Wallachin the sites tended to occur on the benches above the Thompson River and its tributaries.

The last two weeks of the field season were spent on the east coast of Vancouver Island where a survey of archæological sites was undertaken in cooperation with Mr. Wilson Duff, the Provincial Anthropologist, and Dr. Herbert Taylor, of Bellingham, Washington. A number of kitchen middens were examined, their size determined, and their position indicated on sketch maps. Aboriginal mounds were examined near Qualicum, a little way back from the coast-line—a somewhat unexpected discovery.

Dr. Richard S. MacNeish was chosen to direct a joint archæological expedition to northern Mexico, sponsored by the Department of Botany of Harvard University, the American Philosophical Society, the American Academy of Arts and Sciences, and the National Museum of Canada. He was granted special leave from the Museum for this purpose because of the relationship of this study to similar ones in Canada. He remained in Mexico from December 1953 until May 3, 1954. The expedition, besides finding 125 sites in an archæological survey, undertook five excavations in caves. The purpose of these excavations was to investigate the problem of the development of agriculture and the concomitant development of "civilization" in ancient Meso-America.

From June 1 until September 15, an archæological survey was conducted in archæologically unexplored territory along the Arctic coast from Tuktoyaktuk, east to the Mackenzie Delta and to the Alaskan border. Many new Eskimo sites were discovered. Perhaps the most important was one on the east bank of the Firth River, about twenty miles from the Arctic Ocean. This is a large site containing well-preserved bone and artifacts, similar to those found at Cape Denbigh, Alaska.

From January 1 until March 20, 1955, further archæological investigation and laboratory work, which was a continuation of the previous winter's work, was undertaken by Dr. MacNeish on a Guggenheim Fellowship in northern Mexico.

In early May, Thomas E. Lee began archæological survey work in Bruce County. A detailed search for sites was made along both banks of the Saugeen River, from Southampton to Paisley. Some excavation work was performed and a restorable Point Peninsula pottery vessel was discovered. Adjacent areas of Bruce County were examined, from Kincardine to Owen Sound and the Sauble River; five burials were excavated on the Donaldson site; and a rich ash bed and ten associated features were excavated on site No. 36 of Bruce County. Numerous sites were re-examined. A survey of the Thames River Valley from Byron to Mt. Brydges produced important early Indian sites. Several earlier discovered sites were again examined for materials. In mid-June, camp was set up at Sheguiandah on Manitoulin Island in preparation for the major excavations of the Sheguiandah site in July and August. With a party numbering up to fifteen, several trenches were opened; 825 square feet were excavated to depths of as much as nine feet. In co-operation with several geologists, the site was thoroughly tested and significant



progress made in the interpretations of the soil deposits in relation to traces of Early Man. Visiting archaeologists from United States and Canada were impressed with the antiquity of the site. At the same time, extensive excavation (700 square feet) was performed on a Point Peninsula site nearby, with excellent results in material and information. Also, a survey was conducted on Haywood, Partridge, Strawberry, and LaCloche islands, numerous small islands, and 50 miles of eastern Manitoulin shoreline by boat; some important sites were found. Other sites were found in a brief survey north to Espanola and west to Sault Ste. Marie. An examination was made of reported finds near Manitowaning on Manitoulin.

Upon closing Sheguiandah, survey work was carried out in the lower Bruce Peninsula and west of London. Historic features connected with Josiah Henson were visited at Dresden. A brief examination was made of the Tecumseh monument area. A rewarding survey of Nanticoke Creek in the Waterford area produced several sites and early Indian flint quarries. An extensive survey of the Rice Lake area included thorough checks on the Serpent Mound and three other mound groups. Sections of Prince Edward County were examined, particularly a reported cave and an Iroquois site. The important petroglyphs northeast of Peterborough were examined and estimated to date from about 1500 B.C. Reported rock paintings north of Kaladar were checked and tentatively placed in the historic period. These operations produced 41 new sites, enormous collections from Sheguiandah, and several thousand specimens from other sites.

During the summer of 1954 an expedition, sponsored by the National Museum of Canada, the Smithsonian Institution, and the National Geographic Society, conducted archaeological work on Southampton and Coats islands. The party, consisting of Dr. Henry B. Collins, Dr. J. N. Emerson, Mr. William E. Taylor, Jr., and Mr. Eugene Ostroff, was flown on June 23, by the R.C.A.F. from Montreal to Coral Harbour, Southampton Island. On June 25 they left by Eskimo dog team for Native Point, 40 miles down the coast, where they camped for the summer. Excavations were made at two sites at Native Point—a large abandoned village of the extinct Sadlermiut Eskimos with 85 stone and sod house ruins, and a much older Dorset culture site one mile away. Material excavated from some of the Sadlermiut houses, middens, and graves provided a fairly complete picture of Sadlermiut material culture.

The Dorset site, which is probably around 1,000 years old, consists entirely of midden deposits, spread over the flat level surface of an 85-foot-high headland almost a mile back from the sea. Covering an area of over 20 acres, this is one of the largest Dorset sites known. Over 3,000 artifacts of stone, ivory, and bone were excavated. Many of these were typical of the Dorset culture; others were types not previously found in the Canadian Arctic or elsewhere in America. Lamellar flakes, burins, burin spalls, end scrapers, and harpoon blades are similar to those of the Denbigh Flint Complex, an early pre-Eskimo culture on the Bering Sea coast of Alaska, which is probably ancestral to Dorset. Among the new types are delicately chipped microblades less than 15 mm. in length; several forms of backed blades; and slender, pointed, triangular blades recalling forms characteristic of the Tardenoisian and other Mesolithic cultures of Eurasia, but not previously found in America. A second, smaller, Dorset site, which seems

to differ somewhat from the one described, was found buried beneath the surface near the Sadlermiut site. The mammal bones, of which over 45,000 were excavated and 6,000 identified, revealed some striking differences in the food economy of the Dorset and Sadlermiut peoples.

In July a trip was made in an Eskimo Peterhead boat to Coats and Beneas islands. Two house ruins were excavated at a small Sadlermiut site on the north coast of Coats.

### Office Work

Douglas Leechman prepared a paper entitled *Some Pictographs of Southeastern British Columbia* which he subsequently read to the Society for American Archaeology in Albany, New York, where he attended the Annual Convention from May 6 to 8. Plans for work now being undertaken in the area in the the St. Lawrence River valley to be flooded by the engineering works were discussed with Professor T. F. McIlwraith of the Royal Ontario Museum of Archaeology. It was decided to cooperate with his institution in the excavation of any sites sufficiently extensive and important to warrant it.

Dr. Leechman attended the annual meeting of the Royal Society of Canada in Winnipeg early in June, where he read a paper on explanation of pictograph figures. He also attended the Northeast Museums Conference in Albany from October 6 to 8.

Material collected in the field was studied, and work on "Some Pictographs of Southeastern British Columbia" was continued. Photographs taken in the field were listed and titled, and a series of several hundred subject headings for the folklore file were translated from French to English. Work continued on a paper on the Kootenay canoe; this is now nearly complete.

On November 10 and 11 a collection of Eskimo soapstone carvings was examined in Montreal, and a selection was bought for the permanent collections of the Department and of the National Museum. This material was subsequently put on exhibition in the House of Commons on January 12 and 13, 1955, and in the National Gallery of Canada on January 19. A detailed catalogue for this exhibition was prepared. A session of the Steering Committee on Indian Affairs was attended on the 15th of December, and the matter of education for Indians who live in areas remote from schools was considered in detail.

Mr. R. G. Williamson brought in a collection he had made of Slavey Indian folk tales. Secretarial assistance was given him in preparing this material so that the collection could be prepared for publication and one copy retained in the National Museum.

In the spring of 1954, materials excavated from the west end of Great Bear Lake near Franklin were analysed by Dr. MacNeish, and an article was prepared for the Annual Report of the National Museum of Canada for the year 1953-54.

During the autumn of 1954 a preliminary analysis was made of the archaeological material exhumed in southern Manitoba. This material is now in manuscript form and will be submitted for publication as a Museum bulletin in the near future.

Dr. MacNeish also prepared an article for the magazine *ARCHAEOLOGY* entitled "Ancient Maize in Mexico".

Mr. Lee studied the collections he made from the Sheguiandah and other sites investigated during the summer months, and prepared reports.

## Publications

*Vanta Kutchin*, by Douglas Leechman. National Museum of Canada, Bulletin 130, 1954.

*Some Pictographs of Southeastern British Columbia*, by Douglas Leechman. Transactions of the Royal Society of Canada, Sec. II, June, 1954.

*Eskimo Sculpture in Soapstone* by Douglas Leechman. Canadian Geographical Journal, September, 1954.

*The Canadian Scene in Christmas Cards*, by Douglas Leechman. Canadian Geographical Journal, December, 1954.

*Carvings by the Eskimo*, by Douglas Leechman. School Arts, February, 1955.

*An Early Archæological Site near Panuco, Vera Cruz*, by Richard S. MacNeish. Transactions of the American Philosophical Society, Vol. 44, Pt. 4, 102 pages, October, 1954.

*The Stott Mound and Village, near Brandon, Manitoba*, by Richard S. MacNeish. Annual Report of the National Museum of Canada, 1952-53. Bulletin No. 132.

*Ancient Maize in Mexico*, by Richard S. MacNeish. Archæology, a publication of the Archæological Institute of America. In press.

*The Development of Agriculture and the Concomitant Development of Civilization in Meso-America Tamaulipas, Mexico*, by Richard S. MacNeish. Year Book of the American Philosophical Society for 1954.

*Two Sites of Great Bear Lake, Northwest Territories, Canada*, by Richard S. MacNeish. Annual Report of the National Museum of Canada, 1953-54. In press.

*The First Sheguiandah Expedition*, by Thomas E. Lee. American Antiquity, Vol. XX, No. 2.

*The Giant Site, Manitoulin*, by Thomas E. Lee. Annual Report of the National Museum of Canada, 1952-53. Bulletin No. 132.

*The Discovery and Exploration of the Ancient Sheguiandah Site, Manitoulin Island*, by Thomas E. Lee. Autumn issue of Inland Seas, Quarterly Journal of the Great Lakes Historical Society, Cleveland, Ohio.

*Ancient Indian Tribes Once Roamed Manitoulin*, by Thomas E. Lee. Bush News, Vol. III, No. II. October.

## Lectures

BY DOUGLAS LEECHMAN:

*Some Pictographs of Southeastern British Columbia*. Society for American Archæology, Albany, N.Y. May 8, 1954.

*An Explanation of Some Pictograph Figures*. Royal Society of Canada, Winnipeg, June 2, 1954.

*Lo, the Poor Indian!* Canadian Micro-biological Society, Ottawa, March 30, 1955.

BY RICHARD S. MACNEISH:

*Digging Up the Past*. CBOT Television show, November 9, 1954.

*The Development of our Modern Foods*. Y.M.C.A. Luncheon Club, Ottawa, November 26, 1954.

*Ancient Foods in Modern Mouths*. CBOT Television show, December 7, 1954.

*The Brohm Site*. Round Table Discussion of the archæology of the Great Lakes. Society for American Archæology, Detroit, Michigan. December 28, 1954.

*Recent Discoveries in Tamaulipas*. The Ciudad Victoria Lions' Club, Ciudad Victoria, Mexico. February 17, 1955.

*Ancient Foods in Modern Mouths*. National Museum, March 30, 1955.

BY THOMAS E. LEE:

*The Sheguiandah Site.* The Ontario Archæological Society, Toronto, May, 1954; Michigan Geological Society, Manitowaning, June 19, 1954; Ontario Chamber of Commerce, Sheguiandah, June 20, 1954; The Women's Institute of Sheguiandah, Sheguiandah, August 12, 1954; Horticultural Society, Gore Bay, September 14, 1954; Historical Society of Eastern Manitoulin Island, Sheguiandah, October 5, 1954; American Anthropological Association, Detroit, Michigan, December 29, 1954; Archæological and Geological Group, Globe, Arizona, March 8, 1955; Archæological Group of the University of Arizona, Tucson, Arizona, March 11, 1955; Archæological Seminar, Museum of Northern Arizona, Flagstaff, Arizona, March 22, 1955.

*Digging Up the Past.* Saturday Morning Children's Lectures, November 13, 1954, National Museum of Canada.

*Ontario 10,000 B.C.* CBOT Television show, March 1, 1955.

### Accessions

*Thomas E. Lee:* archæological material from Manitoulin Island and Southern Ontario.

*Dr. Douglas Leechman:* archæological material from British Columbia.

*Miss Helen McArthur:* ethnological specimens from the Prairies.

*Dr. R. S. MacNeish:* archæological material from Manitoba and the Northwest Territories.

BY PURCHASE:

Eskimo carvings in soapstone from the eastern Arctic.

## ETHNOLOGY

### Field Work

Marcel Rioux spent the summer of 1954 in Bellechasse County studying urbanization processes and social change in this district. An intensive study of the village of Saint-Vallier was undertaken for the purpose of gathering information on this settlement, which was considered typical of the agricultural lower St. Lawrence region. The survey was conducted in the usual way: direct observation of behaviour, study of the parochial archives, systematic study of family genealogies, interviews, and participation in the village activities whenever possible.

Having completed her survey of the oral literature of Gaspé, Miss Carmen Roy, during the summer of 1954, undertook a study of the fishing techniques and the various dialectal and regional words and expressions associated with them. The aim of such a survey is to gather material for the publication of a glossary covering the language associated with the fishing techniques and activities of Gaspé.

Kenneth Peacock continued in 1954 the tape-recording of Plains Indian music begun in 1953. A short visit to the Pacific Coast and Vancouver Island was also made but little of interest was discovered. The process of acculturation in that area was continued to a marked degree, and little is left of the traditional Indian culture. However, the musical culture of the Plains tribes is still flourishing, and many new recordings were made in Southern Alberta (Blood and Blackfoot), Central Saskatchewan (Cree and Stony), and Southern Saskatchewan (Assiniboine). Rare ceremonies, no longer in general practice, were recorded from the only surviving Crees who remember them.

From June to December, Miss Helen Creighton continued to collect folklore material in Nova Scotia and New Brunswick; as in the past years, her findings were numerous and of good quality.

Luc Lacourcière and Miss Madeleine Doyon of Laval University collected folklore in New Brunswick and in Beauce County, Quebec, respectively.

With a grant from the Carnegie Institute, Claude Desgoffe, a French ethnologist, was engaged last year in a study of the Belcher Islands. The Museum extended facilities to Mr. Desgoffe and in return received ethnological specimens, linguistics, and general information.

### Office Work

Marcel Rioux completed for publication his monograph on Gascons, a Gaspesian community which he investigated in the summers of 1952 and 1953. The materials collected at Saint-Vallier in 1954 were classified and analysed.

Help was given to the Amerindian Anthropology Research in the launching of an anthropological periodical, *Anthropologica*, the first issue of which appeared in 1955.

Mr. Rioux was made Canadian correspondent of the French periodical *Science et Nature*.

Kenneth Peacock transcribed, classified, and analysed materials he collected in the field; he also selected recordings of Canadian Folk and Primitive Music for publication by educational institutions. Mr. Peacock resigned from the Museum in October, 1954.

Mrs. Asen Balikei, who joined the staff in November 1954, devised a new classification scheme for the folklore collections of the Museum. By the end of March 1955, 1,600 French Canadian songs, comprising the Rioux, Roy, and Caron-Dupont collections, had been analysed; the songs are also catalogued according to their themes, types, titles, incipits, and provenance. This new classification and cataloguing system will facilitate further research on all folklore materials.

### Publications

*Description de la culture de l'île Verte*, by Marcel Rioux. National Museum of Canada, Bulletin No. 133, 1954.

*Anthropology and Folklore*, by Marcel Rioux. National Museum of Canada, Bulletin No. 132, 1954.

*Enquête ethno-linguistique*, by Marcel Rioux. Amerindian Anthropology Research Centre, Ottawa, 1954 (In collaboration with Jacques Rousseau and J. Paul Vinay).

*Un bilan de l'anthropologie contemporaine*, by Marcel Rioux. *Revue de Psychologie des Peuples*, Vol. IX, No. 1, 1954.

*Indian Music of Canadian Plains*, recorded and edited by Kenneth Peacock, Ethnic Folkways Library, March, 1955.

### Lectures

By MARCEL RIOUX:

*Cultural Anthropology*—a series of 60 lectures delivered at the University of Ottawa, from Sept., 1954 to April, 1955.



*Les Iroquois: leur passé, leur présent*—National Museum, February 17, 1955.

*Trends in Cultural Anthropology*—The Chesterton Club, University of Ottawa, March 6, 1955.

*The National Museum of Canada*—Radio. Station CKAC, Montreal, January, 1955.

*L'homme peut-il vivre sans mythe?*—Radio. Station CBF, Montreal, January, 1955.

*Forum on Education*—CBC, December 2, 1954.

## NATIONAL HERBARIUM

### Field Work

A. E. Porsild, Chief Botanist, left Ottawa on June 9 to attend the Eighth International Botanical Congress at Paris, France, and to engage in an intensive study of type specimens and other material in various European botanical institutions throughout the remainder of the fiscal year. A total of 340 plants of little or no representation in the National Herbarium were collected during the course of several excursions to the Pyrenees and French Alps held by the Congress during the months of June and July; the Pyrenees offered some excellent opportunities also for observing the results of century-long bad land-use in alpine pastures. Problems of land reclamation and dune control were studied in the low country of the *Landes et Pays Basques occidentales* along the Atlantic Coast. Several trips were also made to Copenhagen, Denmark, where he acted as Representative of the Canadian Wildlife Service at the Fourth General Assembly of the International Union for the Protection of Nature during the August 25 to September 3 meetings; later he submitted a written report to the Chief of that Service. Following the Congress, he examined the 50-odd Michaux types of Canadian plants in the Botanical Museum of Paris, checked Canadian arctic specimens in the Botanical Museum of Copenhagen (collected chiefly by Amundsen's expedition in the GJOA), and spent several months at the Royal Botanic Gardens, Kew, England, where he critically examined material upon which Hooker's *Flora Boreali-Americana* (1829–1840) was based. During the course of this work he photographed over 200 type specimens. He presented papers on Canadian botany at the Royal Norwegian Academy, Trondheim, Norway; the Royal Botanic Gardens, Kew, England; and the University of Aberdeen, Scotland.

W. K. W. Baldwin, assisted by J. Smith, from May 26 to August 24, completed his botanical survey of the Clay Belt region of northern Ontario and Quebec. Collections numbering 619 of the more critical species were made, including sufficient duplicate material for about 1,500 sheets.

H. A. Crum, the newly appointed Bryologist, joined the staff on September 20, and spent the autumn weekends collecting bryophytes in the Gatineau Hills of Quebec. Collections numbering 213 were made, and approximately 1,000 duplicates were prepared for exchange.

### Office Work

A. E. Porsild completed his *Vascular Plants of the Western Canadian Arctic Archipelago* and turned it over to the printer. With Mr. Elliott, he prepared 47 photographs of plants to illustrate the work. He also made considerable progress on his manuscripts *Manual of the Botany of the Canadian Arctic Archipelago* and *Flora of the Mackenzie Basin*. He also

completed a paper on *Saxifraga flagellaris* and submitted it for publication. He checked Lincoln Barnett's article for LIFE magazine on *The Arctic Tundra* and finished checking through the herbarium to complete the spotting of plants on distribution maps in preparation for work on the *Atlas of Canada*.

On April 20 and 21, he engaged in research at the Gray Herbarium of Harvard University and attended an Ottawa meeting of the Wildlife Advisory Board. He left for Europe on June 9.

H. J. Scoggan assumed charge of the herbarium following Mr. Porsild's departure for Europe. He completed his *Flora of Manitoba* and submitted it for publication. He commenced work on a proposed flora of maritime eastern Canada by revising and cataloguing approximately four-fifths of the material in the herbarium from continental Canada east of the 70th meridian. Over 2,200 annotation slips were inserted during the process of revision or standardization of nomenclature. He named 1,157 plants submitted for identification by various institutions and individuals, and a set of eight coloured slides of Churchill plants submitted by Dr. Ivan Abbott, Jackson, Michigan. He also checked, and revised where necessary, 185 plants submitted for this purpose, and checked Mr. Baldwin's 1954 collection and several specimens in the national collection from the Cypress Hills of Saskatchewan upon request of A. J. Breitung.

Dr. Scoggan attended meetings of the Ontario Historical Society and Museum Committee; of the 18th Federal-Provincial Wildlife Conference; and of the Advisory Board of Wildlife Protection—all held in Ottawa; with Miss Marion Dunn, Director, he drew up plans for the October 26 program of the television series "Let's Go to the Museum", and took part in it, together with H. A. Crum and W. K. W. Baldwin. He also represented the herbarium in the final summing-up program of March 29. Dr. Scoggan also worked on plant distribution maps for the "Atlas of Canada" and drew up, with Mr. Baldwin, a tentative list for a proposed film strip on "Spring Flowers".

H. A. Crum reported for duty on September 20, 1954. He donated to the Museum his private herbarium, consisting of approximately 3,500 specimens. These specimens have been incorporated into the herbarium. Work was begun on a complete reorganization of the bryophyte herbarium, and the moss collection has now been put into shape for ready reference.

Much time was devoted to the identification of mosses from various parts of Canada, many of them sent in by government employees, particularly foresters and members of official expeditions. Also, collections or specimens from many parts of the world were sent for identification or confirmation by other bryologists or by botanical collectors. Specimens totalling 2,200 were named.

Progress was made on manuscripts on the moss flora of various regions, and three short papers were prepared for publication. Four issues of *The Bryologist*, the journal of the American Bryological Society, were edited.

Mr. Crum spent ten days on official leave at the herbarium of the New York Botanical Garden in the study of type material pertinent to the monography of the Funariaceae.

W. K. W. Baldwin reviewed his 1952 and 1953 collections, named the 1954 collection, and inserted labels and entered ledger and card index data. He named three small collections from the Ontario Clay Belt and began composing the results of his Clay Belt work for publication.

During the year, some 150 visitors from Canada and abroad visited the National Herbarium of Canada to study specimens in the collection or to consult members of the staff on technical matters.

### Accessions, Loans, and Exchanges

During the year, 4,686 herbarium specimens were received by exchange, 4,942 by donation, and approximately 6,536 resulted from field work or were obtained in exchange for determinations by members of the National Museum staff. Specimens totalling 3,367 were sent on loan to other botanical institutions, and 1,155 were borrowed from them. Duplicate specimens, 2,847 in number, resulting from the field work of the Herbarium staff, were distributed to Canadian and foreign herbaria in continuation of exchanges. Specimens of vascular plants totalling 6,220 were mounted and inserted in the herbarium, thus bringing the total number of mounted vascular plants in the National Collection to 232,716.

Among the more notable accessions are collections of 200 plants from Southampton Island, made by H. B. Collins, Jr.; 150 plants from King William Island and vicinity, made by Mrs. P. F. Cooper; 248 plants from Cunningham Island, Ottawa, made by H. Groh; 115 plants from Boothia Peninsula, made by C. Laverdière; 150 plants from Quebec, made by Fr. Ernest Lepage; 100 plants from Isachsen Island, made by Stewart MacDonald; and Dr. H. A. Crum's private moss herbarium consisting of about 3,500 specimens.

The National Museum gratefully acknowledges the donation of these and the following collections:

- Banfield, A. W. F., Ottawa, Ont.: 24 vascular plants from northern Quebec.
- Bonner, E., Kapuskasing, Ont.: 99 vascular plants from Ontario.
- Bostock, Hugh S., Ottawa, Ont.: 50 vascular plants from the Yukon.
- Breitung, August, Los Angeles, California: vascular plant from Alberta.
- Cadham, Fred, Winnipeg, Man.: vascular plant from Manitoba.
- Christie, R. L., Ottawa, Ont.: 89 plants from Ellesmere Island.
- Cowell, F. N., Timmins, Ont.: 62 vascular plants from Ontario.
- Fowler, Mrs. H. A., Winnipeg, Man.: 3 vascular plants from Manitoba and Ontario.
- Frye, T. C., Seattle, Washington: 27 miscellaneous mosses.
- Hattersley-Smith, G., Ottawa, Ont.: 74 plants from northern Ellesmere Island.
- Harper, Francis, Mount Holly, New Jersey: 28 mosses from Ungava.
- Macpherson, Andrew, Ottawa, Ont.: 60 vascular plants from Prince Patrick and Melville islands.
- Mosquin, Theodore, Brokenhead, Man.: 89 vascular plants from Manitoba and Saskatchewan.
- Oldenburg, Margaret, Minneapolis, Minnesota: 3 vascular plants from Victoria Island.
- Phelps, V. H., Winnipeg, Man.: vascular plant from Manitoba.
- Robson, Miss D. Joan, Banff, Alberta: 3 western vascular plants.
- Stevenson, G. A., Brandon, Man.: 31 vascular plants from Manitoba and Saskatchewan.

## Publications

The following articles were published by the staff of the National Herbarium during the year:

- Land Use in the Arctic*, by A. E. Porsild. Can. Geographical Jour. 48: 232-243 (June, 1954); 49: 20-31 (July, 1954).
- The Vascular Flora of the North American Arctic*, by A. E. Porsild. Reprinted from Proceedings of the Seventh International Botanical Congress, Stockholm, 1950, pp. 613-614 (1954).
- Flowers and Forests*, by A. E. Porsild. In "North of 55", pp. 107-116 (1954).
- Mosses of Mexico*. 1. Species new to the country. By H. A. Crum. Revue bryologique et lichenologique 23 (3-4): 256-264. 1954 (1955).
- Taxonomic Studies in the Funariaceae*, by H. A. Crum and L. E. Anderson. The Bryologist, 58: 1-15. Figs. 1-19. (1955).
- Courses in Bryology and Lichenology to be Offered during the Summer of 1955*, by H. A. Crum. The Bryologist 58: 78 (1955).
- Additions to the Moss Flora of Kentucky*, by H. A. Crum. Trans. Ky. Acad. Sci. 15: 24-26 (1954).

## Lectures

- Taxonomy and Nomenclature*, by A. E. Porsild. Carleton College, Ottawa, April 6, 1954.
- Alpine Flora of the Canadian Rocky Mountains*, by A. E. Porsild. Royal Norwegian Academy, Trondheim, Norway, November 16, 1954. Other lectures on similar topics were given at the Royal Botanic Gardens, Kew, England, on January 18, 1955, and at the University of Aberdeen, Aberdeen, Scotland, on January 31, 1955.
- Robert Holmes' Wild Flower Paintings*, by W. K. W. Baldwin. Toronto Field Naturalists Club, April 5, 1954, and repeated to Toronto Garden Club, March 24, 1955.
- Canoe Travel*, by W. K. W. Baldwin. Y.M.C.A., Ottawa, April 22, 1954.
- Natural History for School Children*, by W. K. W. Baldwin. Elgin Home and School Association, Ottawa, October 12, 1954.
- Carnivorous Plants*, by W. K. W. Baldwin. Macoun Field Club, Ottawa, November 2, 1954.
- Natural History for Cubs*, by W. K. W. Baldwin. 55th Cub Pack, Manor Park, Ottawa, March 10, 1955.
- Spring Wild Flowers*, by W. K. W. Baldwin. National Museum of Canada, National Museum Saturday Morning Series, March 12, 1955.

## ZOOLOGY

### Field Work

L. S. Russell carried out a reconnaissance of the Tertiary sedimentary rocks of southwestern British Columbia in search of fossil vertebrates, particularly mammals. Among the formations examined were the Sooke of Vancouver Island; the Burrard, Kitilano, and Huntingdon of the Fraser River area; the Princeton group; the Coldwater beds at Merritt; the Tranquille beds near Kamloops; and various Tertiary formations of the Okanagan and Kettle River valleys. Fossil fishes and insects were obtained at Kamloops and Princeton, and a new fauna of mollusca at Princeton. Further work on this problem is required, particularly in the Princeton area. Along with the search for fossils, specimens of living birds and mammals were taken for the collection. A special effort was made in the Flathead Valley of northwestern Montana to obtain certain specimens of birds whose presence there might help to solve some bird distribution

problems in southeastern British Columbia. The return trip to Ottawa was made via Cody, Wyoming, where it was possible to arrange for the purchase of an important collection of Eocene mammals for comparison with similar finds in Canada. At Rapid City, South Dakota, an opportunity was afforded to examine the important Oligocene section under the guidance of Professor James Bump of the South Dakota School of Mines. This examination provided valuable information for use in the study of the Tertiary of Saskatchewan.

W. Earl Godfrey studied the bird fauna of Cape Breton Island; he concentrated on the Baddeck area and the vicinity of Cape North. Emphasis was placed on securing data on the distribution, numerical status, and ecology of the birds of the region, and on obtaining a collection of birds breeding there. Specimens numbering 356 were collected. These include the first record of the Catbird from Cape Breton Island. Some observations were also made in other parts of the Maritime Provinces. Raymond d'Entremont rendered efficient service as assistant.

Austin W. Cameron conducted a field investigation of the mammals of Prince Edward Island as part of a broad study of the mammals of the Gulf of St. Lawrence islands. Work was confined mainly to the eastern part of the Island, particularly the Souris River and Hunter River areas. The population of small mammals here was found to be quite high, and four species were added to the Island's list of mammals. A good series of specimens was obtained despite unfavourable weather. It was established that the woodchuck, porcupine, raccoon, skunk, and white-tailed deer are not native to the Island, although the last three have been introduced. The numerical composition of the various species was found to be very different from that of the mainland. Some species were also found to differ in habits. For example, the mink on the Island occur chiefly in coastal brackish-water marshes. A week in September was spent on the islands of Miscou and Shippigan in northeastern New Brunswick. Here also the skunk, raccoon, porcupine, and woodchuck were found to be absent. Some collecting for comparative purposes was done on the mainland of New Brunswick. During the season 97 specimens were obtained. Expert assistance was given by Marshall Ronalds.

E. L. Bousfield studied the distribution and ecology of the marine invertebrates of the inter-tidal and shallow water zones in the coast waters of Cape Breton Island and Newfoundland. Along the 2,000-mile coast line, 105 field stations were established, 65 of them in Newfoundland. Approximately 7,000 specimens of marine invertebrates were obtained, as well as 10 lots of terrestrial and fresh-water invertebrates of interest to specialists. A motion picture record of techniques was made.

Sherman Bleakney collected reptiles and amphibians in the Ottawa area, in the vicinity of Lac St. Jean, and in the eastern townships of Quebec. In spite of unusually high water, 1,330 specimens were collected and measured. Many interesting range extensions were established including a 100-mile eastward extension of the known range of the Map Turtle. Important data were secured on the number of eggs laid by the Snapping Turtle. Particularly good results were obtained at Cloyne, Ontario. Bleakney was assisted by Francis Cooke, who also contributed a number of specimens collected in his own time.



G. E. Lindblad continued the exploration of the dinosaur field along the Red Deer River in Alberta. Weather was very unfavourable, but several interesting specimens of dinosaurs were obtained, as well as a fine turtle skeleton and a partial skull of *Champsosaurus*. Lindblad was assisted by H. L. Shearman and Michael Herniak. Later in September, Lindblad investigated the discovery of mastodon bones at Tupperville, Ontario, reported by Professor Dreimanis of the University of Western Ontario. The specimens, unfortunately, proved to be too imperfect to justify collecting.

S. D. MacDonald made a zoological investigation in the vicinity of Isachsen, Ellef Ringnes Island, N.W.T. He was assisted by George Blanchard. Work was divided between the birds and terrestrial mammals, and the marine invertebrates. With the help of a food drop by the R.C.A.F., it was possible to operate some distance from the station. Mammals and birds were scarce, but a number were taken. A large collection of marine invertebrates was made. Some mosses and flowering plants were collected, and numerous colour photographs were taken. On completion of the work at Isachsen, MacDonald visited the vicinity of Eureka on Ellesmere Island to look over the area with future field work in mind.

John A. Crosby studied the birds and other wildlife of eastern Quebec, particularly the nesting colonies of sea birds on Bonaventure Island. Numerous sketches and colour photographs were made for use in preparing illustrations and exhibits. Later in the summer a similar study was made at Resolute Bay, N.W.T., and some bird specimens were collected, including the northernmost record of the Savannah Sparrow.

### Office Work

L. S. Russell completed a paper entitled *Fossil Mammals and Inter-continental Connections*, which was the text of a lecture given at the University of Texas in February, 1954. He also completed a report on the *Mollusca of the Kishenehn Formation of British Columbia* for the Annual Report of the National Museum. Almost completed was the description of skulls and skeleton of the Cretaceous reptile *Champsosaurus*. Work was resumed on a report on the Tertiary mammals of Saskatchewan. As Canadian member of the committee on the Continental Cenozoic of North America, Russell prepared a number of descriptions of Canadian formations. He generally supervised the work of the Zoology Section and gave special supervision to that of the laboratory of vertebrate palæontology. Information was supplied on specimens sent for identification by the following: Geological Survey of Canada; National Film Board; The Manitoba Museum; The Saskatchewan Provincial Museum; the Department of Geology, University of Saskatchewan; the Department of Zoology, University of British Columbia; The American Museum of Natural History; the Department of Geology, University of Nebraska. He served as Secretary-Treasurer and acting Editor of the Canadian Museums Association and attended the annual meeting at Winnipeg in June.

W. Earl Godfrey completed his report on the birds of the East Kootenay region, British Columbia, based on the collections and observations made during the 1953 field season. He began a report on the birds of Cape Breton Island. A short paper entitled "The Bills and Feet of

Birds" was completed for publication. Editorial work was performed for the "Canadian Field-Naturalist", "Bird-Banding", and "The National Geographic Magazine". In collaboration with Mr. Hoyes Lloyd of Ottawa, much work was done on the forthcoming Check-list of North American birds. Bird specimens were identified for the following: Canadian Wildlife Service; W. J. Mills, Halifax, N.S.; Reverend René Tanguay, Collège de Ste. Anne de la Pocatière, Kamouraska, Que.; Royal Ontario Museum of Zoology and Palæontology; Leo Jobin, Williams Lake, B.C.; Department of Zoology, University of Michigan; Department of Ornithology, Carnegie Museum, Pittsburgh, Penn.; Bird Research Foundation, Cleveland, Ohio; Dr. Harry C. Oberholser, Cleveland, Ohio.

A. W. Cameron completed the first draft of a report on the mammals of Newfoundland, Anticosti Island, and the Magdalens. He continued preparation of reports on the mammals of Cape Breton Island and Prince Edward Island. Because of faunal similarity of these two regions, the collections are being studied concurrently. By the end of the year he had completed the sections on the Insectivora, Chiroptera, and part on the Carnivora. He spent some time on curatorial work on the mammal collection, including accessioning. He prepared the text for film strips on Canadian mammals and did editorial work for the "Canadian Field-Naturalist". Using live animals loaned by the Granby Zoological Society, a television show on mammals was prepared and presented. Mammal specimens were identified for the following organizations or information on mammals was supplied to them: Quebec Society for the Protection of Birds; Provancher Society of Natural History; Department of Lands and Forests of Ontario; Dr. O. E. Höhn, University of Alberta; Dr. W. H. Boyd, McGill University; Leo Jobin, Williams Lake, B.C.; Dr. H. B. Hitchcox, Middlebury College, New Hampshire; Prof. D. A. Osborn, Boston University; Department of Mammals, Carnegie Museum of Pittsburgh; Dr. G. R. Hall, University of Kansas. During part of the year Mr. Cameron was absent on leave in order to complete his graduate studies at McGill University.

E. L. Bousfield completed an investigation of shore-line invertebrates of the St. Lawrence Estuary and the Gaspé Coast. He prepared a report on the ecological control of barnacles in the Miramichi Estuary. He also completed a paper on the Cirripede Crustacea of the Hudson Strait Region. He began a study of amphipod crustaceans of Canada. He identified invertebrates for the following or supplied information to them: Dr. R. L. Christie and Dr. V. K. Prest, Geological Survey of Canada; Entomology Division, Department of Agriculture; Fisheries Research Board; Atlantic Biological Station, St. Andrews, N.B.; W. L. Klawe, St. Andrews, N.B.; M. Tolley, Nova Scotia Institute of Science; E. Corbell, Marine Biological Station, Grande Rivière, Que.; Dr. V. D. Vladykov, Quebec Department of Fisheries; H. B. Sprecht, Kemptville Agricultural College, Kemptville, Ont.; H. Fulton, Chilliwack, B.C.; Pacific Biological Station, Nanaimo, B.C.; Dr. C. R. Shoemaker, United States National Museum; Miss M. Oldenburg, St. Paul, Minnesota. New and old collections of invertebrates were accessioned, catalogued, and arranged. Some renovation of the collection and of individual specimens was undertaken.

Sherman Bleakney continued his study of the reptiles and amphibians of Eastern Canada, including their distribution, ecological relationships, and taxonomy. Many new data were added to the distributional maps. Field collections were labelled and installed in the permanent storage. The herpetological collection was generally overhauled. The catalogue of amphibians and reptiles was kept up to date. Assistance was given in planning film strips on frogs and reptiles of Canada. Part of the period was spent by Mr. Bleakney completing his graduate studies at McGill University.

Wann Langston, Jr. joined the staff of the National Museum in October 1954. Formerly he was lecturer in palæontology and in charge of the laboratory of vertebrate palæontology at the University of California. At the National Museum of Canada he is to take charge of the collections of fossil vertebrates and to conduct research in vertebrate palæontology. His first task was to plan a new catalogue system for the collection of fossil vertebrates. After this was installed, he began the work of transferring data to the new records. New material was accessioned, with some rearrangement of the study collection. A survey was made of the space requirements for the collection of fossil vertebrates. General supervision was given to the work of the laboratory of vertebrate palæontology. A study was made of the posture of the fossil reptile *Champsosaurus* to aid in the mounting of a skeleton for exhibition. Fossil vertebrates were identified for the following: Dr. V. K. Prest and Dr. E. T. Tozer, Geological Survey of Canada; Mr. Rolf Rolfs, Ottawa; Prof. W. O. Kupsch, Department of Geology, University of Saskatchewan.

G. E. Lindblad mounted the skeleton of the fossil reptile *Champsosaurus*; this included considerable restoration of missing bones.

The total numbers of specimens or lots of specimens in the collections of the Zoology section at the end of the fiscal year are estimated to be as follows: mammals, approximately 21,500; birds, approximately 40,000; reptiles and amphibians, lots of one or more, 3,033 (estimated number of specimens, 8,500); fishes, lots of one or more, approximately 2,000; marine and freshwater invertebrates, approximately 120,000; fossil vertebrates, catalogued specimens, 4,475 (this does not include a large number of specimens that have never been unpacked).

## Publications

- Evidence of Tooth Structure on the Relationships of the Early Groups of Carnivora*, by Loris S. Russell. *Evolution*, vol. 8, No. 3, June 1954.
- A New Species of Eurypterid from the Devonian of Gaspé*, by Loris S. Russell. National Museum of Canada, Annual Report for the Fiscal Year 1952-53. Bulletin 132, 1954.
- Mammalian Fauna of the Kishenehn Formation, Southeastern British Columbia*, by Loris S. Russell. National Museum of Canada, Annual Report for the Fiscal Year 1952-53, Bulletin 132, 1954.
- The Eocene-Oligocene Transition as a Time of Major Orogeny in Western North America*, by Loris S. Russell. *Transactions Royal Society of Canada*, ser. 3, vol. 48, sec. 4, 1954.
- A New Species of Cephalaspis from the Devonian Gaspé Sandstone at D'Aiguillon*, by Loris S. Russell. *Le Naturaliste canadien*, vol. 81, No. 12, 1954.
- The Dickcissel on the Atlantic Coast of Canada*, by W. Earl Godfrey. *The Auk*, vol. 71, No. 3, 1954.

- Birds of Prince Edward Island*, by W. Earl Godfrey. National Museum of Canada, Annual Report for the Fiscal Year 1952-53, Bulletin 132, 1954.
- Two reviews of literature, by W. Earl Godfrey. Canadian Field-Naturalist, vol. 68, No. 1, 1954.
- Four reviews of literature, by W. Earl Godfrey. Bird-Banding, vol. 25, Nos. 2 and 3, 1954, and vol. 26, No. 1, 1955.
- Some Physical Features of the Miramichi Estuary*, by E. L. Bousfield. Mimeographed publication of the Atlantic Oceanographical Group, St. Andrews, New Brunswick, 7th May, 1954.
- The Distribution and Spawning Seasons of Barnacles on the Atlantic Coast of Canada*, by E. L. Bousfield. National Museum of Canada, Annual Report for the Fiscal Year 1952-53, Bulletin 132, 1954.
- One review of literature, by E. L. Bousfield. Canadian Geographical Journal, September 1954.
- Hadrosaurs in Baja California*, by Wann Langston, Jr., and M. H. Oakes. Geological Society of America Bulletin, vol. 65, 1954.

### Lectures

- The Eocene-Oligocene Transition as a Time of Major Mountain Building*, by Loris S. Russell. Royal Society of Canada, sec. IV, Winnipeg, Manitoba, 1st June, 1954.
- Museum techniques*, by Loris S. Russell. Canadian Museums Association, Winnipeg, Manitoba, 4th June, 1954.
- The Story of the Horse*, by Loris S. Russell. National Museum Lecture Series, 23rd March, 1955.
- Birds of Canada*, by W. Earl Godfrey, John Bird, and Clyde Gilmour. CBC Television series, Window on Canada, 25th March, 1955 (on film).
- The Control of Mammal Pests*, by Austin W. Cameron. 12th Annual Convention of the Canadian Pest Controllers' Association, Montreal, 10th May, 1954.
- Mammals of Canada's Eastern Islands*, by Austin W. Cameron. Macoun Field Club, 15th March, 1955.
- The Barnacles of the Miramichi Estuary*, by E. L. Bousfield. Initiation Banquet of the Radcliffe Chapter of the Society of Sigma Xi, Harvard University, 26th May, 1954.
- Distributional Ecology of Barnacles from the Atlantic Coast of Canada*, by E. L. Bousfield. Annual Meeting of the Ecological Society of America, Gainesville, Florida, 6th September, 1954.
- The Nine Herpetofaunal Sections of Nova Scotia*, by Sherman Bleakney. Annual Meeting of the American Society of Ichthyologists and Herpetologists, Gainesville, Florida, 8th September, 1954.
- Bird Painting*, by John A. Crosby. Bird Study Group of the Ottawa Field-Naturalists Club, 4th November, 1954.
- Aquariums and Terrariums*, by Miss V. M. Humphreys, Macoun Field Club, Junior and Intermediate groups, 19th February, 1955.

### Accessions

#### Mammals

#### BY GIFT:

- Banfield, A. W. F., Canadian Wildlife Service, Ottawa, Ontario: 6 mammal skins and skulls; seal skull; white-tailed deer skull; caribou skull.
- Bradley, S., Stittsville, Ontario: weasel.
- Chesire, W. A., Green River Laboratory, St. Jacques, New Brunswick: bog lemming.
- Crawford, Dr. Mary, Invermere, British Columbia: cougar; black bear.
- Deer, Constable A., R.C.M.P., Frobisher Bay, N.W.T.: walrus skull; wolf skull.
- Ellis, D. V., Department of Zoology, McGill University, Montreal, Quebec: 7 mammal skins and skulls.
- Gorham, David, Brown's Flats, New Brunswick: 4 mammals.

- Harris, George P., Ottawa, Ontario: flying squirrel.  
 Hattersley-Smith, G., Ottawa, Ontario: set of caribou antlers.  
 Manning, T. H., Ottawa: 2 snowshoe hares.  
 Ozburn, Major R. H., R.C.A.M.C.: 21 skins and 22 skulls.  
 Pimlott, D. H., Carmack, Newfoundland: 2 bear skulls.  
 Pritchard, Dr. A. L., Ottawa, Ontario: 2 Alaska fur seals.  
 Scott, Mrs. W. E., Ottawa, Ontario: narwhal tusk.  
 Sergeant, David E., Department of Fisheries, St. John's, Newfoundland: 6 cetacean skulls.  
 Snyder, Colonel Harry, Montreal, Quebec: 2 caribou skulls.

BY PURCHASE:

- Moore, J. E., Sarasota, Florida, U.S.A.: hippopotamus skull.  
 Ward's Natural History Establishment, Rochester, New York: skeletons of *Loris gracilis*, *Tupaia feruginea*.

BY MUSEUM EXPEDITION:

- Cameron, A. W., and Marshall Ronalds, Museum expedition to Prince Edward Island and New Brunswick: 97 mammals.  
 MacDonald, S. D., and George Blanchard, Museum expedition to Isachsen, N.W.T.: 41 mammals.  
 Russell, L. S., Museum expedition to southern British Columbia: 3 mammals.

BY MEMBERS OF STAFF:

- Humphreys, Miss V. M., Zoology Section: shrew.  
 Leechman, Dr. J. Douglas, Anthropology Section: rhinoceros horn.

**Birds**

BY GIFT:

- Andrews, Carl, Ottawa, Ontario: albino song sparrow.  
 Anonymous: 4 bird skins.  
 Atkins, T. H., Ottawa, Ontario: loon; water-thrush.  
 Bambrick, Ray, Chelsea, Quebec: screech owl.  
 Barter, Robert, Ottawa, Ontario: flicker.  
 Bellefeuille, Jean de, Ottawa, Ontario: Maryland yellowthroat.  
 Bennett, C. H., Ottawa, Ontario: 7 bird skins.  
 Blakely, D. J., Ottawa, Ontario: 25 bird skins.  
 Brown, Miss G. L., Ottawa, Ontario: screech owl.  
 Campbell, J. Mitchell, Ottawa, Ontario: killdeer.  
 Cronkhite, C. J., Calgary, Alberta: 2 magpies; sharp-tailed grouse; Hungarian partridge.  
 DeLury, Ralph E., Ottawa, Ontario: loon.  
 Ellis, D. V., Department of Zoology, McGill University, Montreal, Quebec: 8 birds from Coppermine, N.W.T.  
 d'Entremont, Raymond, Ottawa, Ontario: 31 birds.  
 Harvey, Phidelem, Ottawa, Ontario: coot.  
 Höhn, Dr. E. O., Edmonton, Alberta: red phalarope skull; 2 nighthawk skins; a spruce grouse skeleton.  
 Illman, W. I., Ottawa, Ontario: a black and white warbler.  
 Jobin, Leo, Williams Lake, Caribou, British Columbia: 4 swifts.  
 McLachlan, Rory, Masson, Quebec: barn owl.  
 MacLachlan, Dr. L. E., Ottawa, Ontario: magnolia warbler.  
 Manning, T. H., Ottawa, Ontario: Canada jay.  
 Mills, Eric, Ottawa, Ontario: olive-backed thrush.

Munro, David, Canadian Wildlife Service, Ottawa, Ontario: ruddy duck; parula warbler.

Nesbitt, Dr. H., Ottawa, Ontario: American merganser.

Ommanney, G. G., Hudson Heights, Quebec: 20 bird skins.

Ross, Edna G., Pakenham, Ontario: goldfinch.

Scarfe, S., and R. Mayhew, Ottawa, Ontario: song sparrow; English Sparrow.

Scobie, K. R., Ottawa, Ontario: yellow-bellied sapsucker.

Sherwood, Peter, Ottawa, Ontario: banded starling.

Smith, Mrs. H. R., Ottawa, Ontario: nighthawk.

Smith, John, Ottawa, Ontario: Connecticut warbler; brant goose.

Stirrett, Dr. George M., Canadian Wildlife Service, Kingston, Ontario: 6 bird skins.

Swain, Dr. J. W., Ottawa, Ontario: veery.

Tait, Eric M., Summerland, British Columbia: 3 house finches.

Tufts, Robie W., Wolfville, Nova Scotia: 8 bird skins.

Weatherburn, Mrs. A. E., Ottawa, Ontario: Canada warbler; magnolia warbler.

BY EXCHANGE:

United States Fish and Wildlife Service, Washington, D.C.: heath hen.

BY MUSEUM EXPEDITION:

Crosby, J. A., Museum expeditions to Resolute Bay, N.W.T., and St. Tite des Caps, Quebec: 10 bird skins.

Godfrey, W. E., and R. d'Entremont, Museum expedition to Cape Breton Island, Nova Scotia: 326 bird skins.

MacDonald, S. D., and George Blanchard, Museum expedition to Isachsen, N.W.T.: 58 bird skins.

Russell, L. S., Museum expedition to British Columbia and Montana, U.S.A.: 7 bird skins.

BY MEMBERS OF STAFF:

Blanchard, George, Zoology Section: 22 bird skins.

Godfrey, W. E., Zoology Section: Hungarian partridge.

Gorham, S. W., Zoology Section: 12 bird skins.

*Reptiles, Amphibians, and Fishes*

BY GIFT:

Animal Chemistry Unit, Department of Agriculture, Ottawa, Ontario: 3 live alligators.

Bauche, Mrs. A. W., Ottawa, Ontario: green snake.

Charbonneau, Louis, Ottawa, Ontario: skull and hyoid apparatus of a snapping turtle.

Clark, Miss Roslyn, Cloyne, Ontario: eft.

Coste, E., Ottawa, Ontario: two-headed garter snake.

Denman, Norris, Ottawa, Ontario: 2 two-lined salamanders; 2 dusky salamanders; snapping turtle; red-bellied snake; 2 garter snakes.

Hennessey, T. S., Canadian Wildlife Service, Ottawa, Ontario: water snake.

Ireton, A. L. S., Ottawa, Ontario: garter snake.

Kelly, Andy, City View, Ontario: 2 leopard frogs; 2 mink frogs; green frog.

Perkins, Miss L., and Miss P. O'Brien, Ottawa, Ontario: snapping turtle.

Runge, Fred, Ottawa, Ontario: red-bellied snake.

Schad, Gerard A., Ottawa, Ontario: 8 salamanders.

Smith, Harlan I. (estate), Ottawa, Ontario: garter snake skin.

Young, Ken, Ottawa, Ontario: live alligator.

BY MUSEUM EXPEDITION:

Bleakney, S., and F. Cook, Museum expedition to Ontario and Quebec: 980 amphibians; 223 reptiles.

MacDonald, S. D., and George Blanchard, Museum expedition to Isachsen, N.W.T.: 13 lots of fishes.



**BY MEMBERS OF STAFF:**

Bleakney, S., Zoology Section: 10 green tree frogs; toad; 2 snakes; snapping turtle shell.

Gorham, S. W., Zoology Section: 2 spring peepers; 7 wood frogs; bull-frog; 30 specimens of frogs, salamanders, etc.; eggs of various species of salamanders; 3 four-toed salamanders; 2 two-lined salamanders; milk snake; 6 garter snakes; 8 red-bellied snakes.

Russell, L. S., Zoology Section: toad.

***Invertebrates*****BY GIFT:**

Barkalow, F. S., Jr., North Carolina: vial; 2 lots land snails.

Edwards, C., Belfast, Northern Ireland: 4 vials marine amphipods.

Fulton, H., Chilliwack, British Columbia: 2 vials land snails.

Hart, J. L., Pacific Biological Station, Nanaimo, British Columbia: 2 vials salmon tapeworms (types).

Hynes, H. B. N., University of Liverpool, England: 10 vials freshwater amphipods.

Ide, Dr. F. P., Toronto, Ontario: 2 specimens freshwater amphipods.

Mitchell, J. C., Ottawa, Ontario: specimen freshwater snail.

Pacific Biological Station, Nanaimo, British Columbia: 2 vials helminth parasites of whales.

Pike, G. C., Pacific Biological Station, Nanaimo, British Columbia: 2 vials whale lice.

Royal Ontario Museum of Zoology, Toronto, Ontario: 860 lots marine invertebrates.

Smith, M. W., Atlantic Biological Station, St. Andrews, New Brunswick: 3 specimens of slugs.

Thompson, I. C., Pembroke, Ontario: a jar freshwater bryozoa.

**BY EXCHANGE:**

United States National Museum, Washington, D.C.: 5 lots marine amphipods.

**BY MUSEUM EXPEDITION:**

Godfrey, W. E., Museum expedition to Cape Breton Island, Nova Scotia: 3 lots land snails.

Bleakney, S., Museum expedition to Ontario and Quebec: 10 lots amphipods, snails, and other invertebrates.

Bousfield, E. L., Museum expedition to Nova Scotia, Newfoundland, and South Carolina, U.S.A.: 179 lots of marine invertebrates; 2 vials marine crustaceans.

MacDonald, S. D., and G. Blanchard, Museum expedition to Isachsen, N.W.T.: 107 lots marine invertebrates; 15 lots parasites, terrestrial and other invertebrates.

Russell, L. S., Museum expedition to British Columbia: 5 lots land snails; 1 lot bivalves.

**BY MEMBERS OF STAFF:**

Bleakney, S., Zoology Section: 3 millipedes.

MacDonald, S. D., Zoology Section: 4 vials land snails.

***Fossil Vertebrates*****BY GIFT:**

Woodland Boys' Camp, Luskville, Que., per D. C. Maddox and H. Groh: seven vertebrae of a seal, from Pleistocene gravels.

Carnegie Museum, Pittsburgh, Pa., per J. LeRoy Kay: 13 plaster casts of Tertiary mammal skulls, jaws, and teeth from Western United States, and three mammal dentitions from Oligocene of Pipestone Springs, Montana.

**BY PURCHASE:**

Allen, J. M., Cody, Wyoming: collection of reptile and mammal fossils from the Lower Eocene of Park and Bighorn counties, Wyoming.

## BY EXCHANGE:

American Museum of Natural History, New York, N.Y.: plaster casts of limbs and feet of extinct reptile *Champsosaurus*.

## BY MUSEUM EXPEDITION:

Lindblad, G. E., Museum expedition to Steveville district, Alberta: collection of Cretaceous reptile remains, including a nearly perfect skull of the crocodile *Leidyosuchus*; 2 skull caps of the dome-headed dinosaur, *Stegoceras*; several turtle shells and one skeleton; and numerous isolated bones of dinosaurs.

Russell, L. S., Museum expedition to southwestern British Columbia: 2 specimens of fish, *Amyzon brevipinne*, from the Tertiary of the Princeton district, and one of *Amyzon* sp. from the Kamloops district, B.C.

## BY TRANSFER FROM THE GEOLOGICAL SURVEY OF CANADA:

Bell, W. A.: 5 specimens of fish, *Amyzon* spp., and other fragments, from Tertiary of Princeton district, B.C.

Rice, H. M. A.: one specimen of fish, *Amyzon brevipinne*, from Tertiary near Princeton, B.C.

Tozer, E. T.: 13 pieces of rock containing fragmentary arthrodire plates from mid-Palæozoic of Melville and Prince Patrick islands, N.W.T.; several ichthyosaur vertebrae, ribs and a humerus of an ophthalmosaur, vertebrae and limb bones of a plesiosaur, from Mesozoic marine deposits of Prince Patrick Island, N.W.T.

Prest, V. K.: 2 fragments of bone from late Palæozoic red beds of Prince Edward Island.

MacLaren, A. S.: 6 rock slabs containing bones and scales of the early bony fish *Elonichthys*, from Palæozoic deposits of Cape Breton Island, N.S.

## SUMMARY OF ARCHÆOLOGICAL INVESTIGATIONS IN SOUTHEASTERN MANITOBA

*By Richard S. MacNeish*

Geographically and ethnologically, Manitoba was an area of transition and contrast. Its northern forests were occupied by Athabaskan and Cree with simple nomadic hunting cultures, and its northeasternmost Barren Lands were inhabited by the Eskimo with their maritime oriented life. From these, the easternmost example of Plains culture, held by the Siouian-speaking Assiniboine in the southwestern section of the province, is distinct. All this in turn contrasts with the westernmost example of Woodland culture, that of the Algonquin-speaking Cree in the southeast part of Manitoba.

This wide variety of ways of life within a limited area, as well as their position in the wider framework of North American prehistory, poses a series of crucial problems to the New World archæologist. Do the Siouian-speaking Assiniboine, who have their linguistic relationships to the south, represent an intrusion of the Assiniboine into an area that was once all Algonquin-speaking?<sup>1</sup> Was Manitoba once the home of the Algonquin-speaking peoples who later moved out into the Plains, such as the Blackfoot, Cheyenne, Cree, and Gros Ventre?<sup>2</sup> What was the culture of the Canadian Plains like before the introduction of the horse? Do the burial mounds of the Assiniboine represent a tradition that came from Asia through Manitoba and passed into the eastern United States<sup>3</sup>, or are these burial mounds merely a late diffusion from the east? Does the Woodland pottery in Manitoba with its Asiatic affiliations indicate but a step in the diffusion of Woodland pottery from Asia to eastern North America, or is it a trait that has spread westward?<sup>4</sup>

With these problems in mind the National Museum of Canada began a three-year program of archæological investigations in Manitoba.<sup>5</sup> In 1951 Boyd Wettlaufer undertook a survey of the southern part of the province and discovered 149 sites. During the same season, R. S. MacNeish excavated the Larter, Lockport, Anderson, and Alexander's Point sites. In 1952 the Stott Mound near Brandon, Manitoba,<sup>6</sup> and a site near Gilbert Plains, Manitoba, were excavated. During 1953, MacNeish, with the assistance of George Zaborski and Douglas Ternent, excavated Cemetery Point, the Sturgeon Falls, the Waulkinen, Toukko, and the United Church sites. Excavation and survey have yielded materials from 242 sites. As may be seen from the locations of the excavations, our activities were principally confined to southeast Manitoba, and the body of this report will be concerned with that region (*See Map 1*).

<sup>1</sup> Kroeber, 1939, p. 83.

<sup>2</sup> *Ibid.*, pp. 81-82.

<sup>3</sup> Ritchie, 1955.

<sup>4</sup> McKern, 1937.

<sup>5</sup> I am particularly indebted to Mr. L. Johnson, Manitoba Provincial Librarian, whose co-operation and efforts greatly assisted our investigations in Manitoba; during the survey and excavations of the sites, to Mr. and Mrs. P. Stokes, Mrs. T. Helyar, and especially to Peter Grant of Winnipeg; to Dr. Ralph Bird and his family of Brandon, Manitoba; Mr. Chris Vickers of Baldur, Manitoba; Mr. Gordon Hoover of Melita, Manitoba; and Mr. Fred Thomson of Portage la Prairie, who all were most generous in assisting the parties from the National Museum of Canada. I should also like to thank the Larter family of Parkview, Manitoba; the Toukko and Waulkinen families, who live along the Pinewa Channel; the Joe Cason family of Gilbert Plains; Mr. J. Casey of Casey Shows, and various members of the Manitoba Park Service in the Whiteshell area, all of whom were most hospitable in allowing me to excavate on sites on their properties.

<sup>6</sup> MacNeish, 1954.

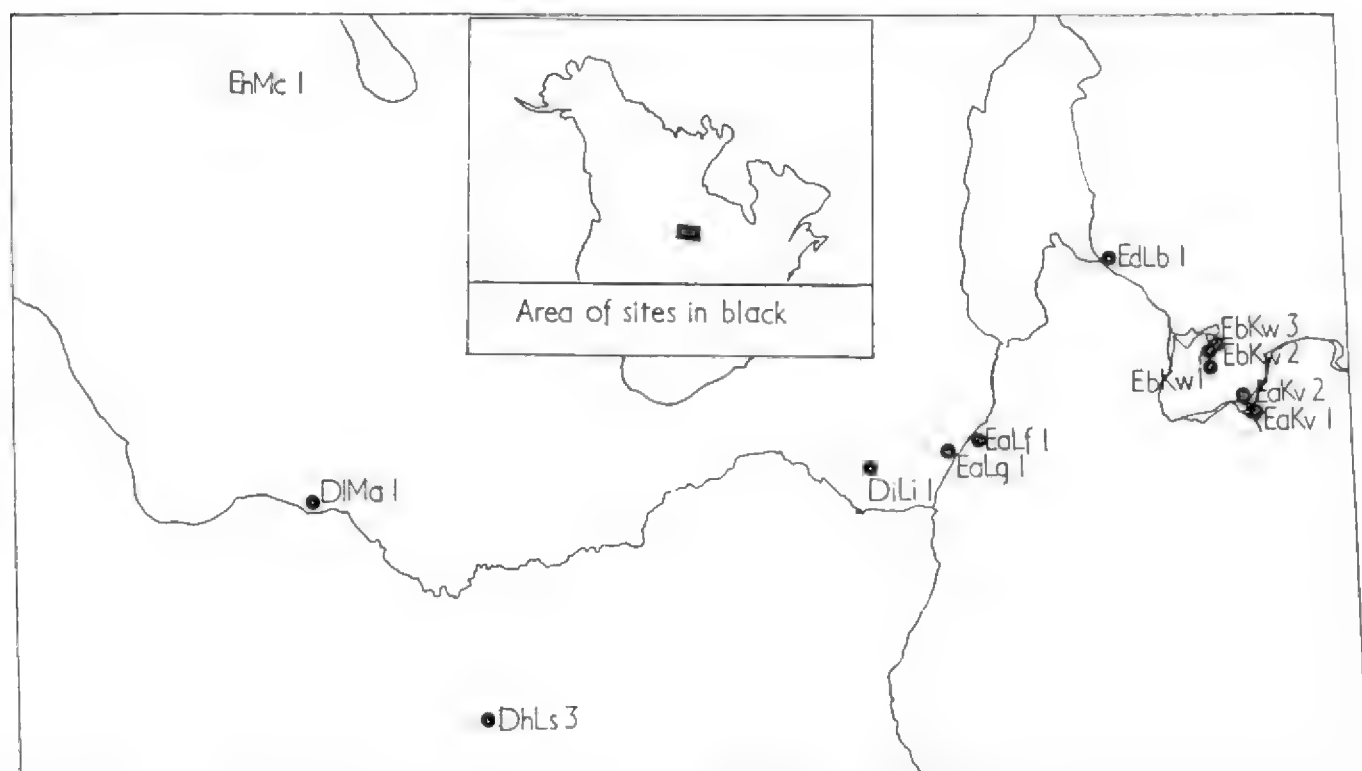


Figure 1. Map showing position of sites.

In the excavations an attempt was made to uncover stratified sites at the outset and then later dig loci with but a single cultural manifestation. One of the first sites excavated was the Lockport site (EaLf 1) on the eastern bank of the Red River, about twenty miles north of Winnipeg. Here an area 20 by 25 feet was dug to a depth of 6 feet. Five feet of refuse occurred containing five archaeological components, which were for the main part separated by distinctive sterile strata. The top two levels contained materials belonging to the Selkirk Focus, and Levels 3 and 4 from a thick flood layer contained thin lenses of similar material. Level 5 was a layer of dark refuse rich in Manitoba Focus remains. Level 6 was a mainly sterile sand layer but did contain some Nutimik Focus remains, as did Levels 7 and 8. Underlying these, in Levels 9 and 10, in sticky grey clay, were artifacts of the Anderson Focus, and in the yellow clays of Levels 11 and 12 were two burned floors containing materials that could be classified as the Larter Focus.

The other stratified site was found at the junction of the Winnipeg and Whiteshell rivers, about fifty miles east of the southern tip of Lake Winnipeg. This site, called the Cemetery Point site (EaKv 1) had three distinctive sets of cultural remains, one on top of the other. In the humus were materials belonging to the Selkirk Focus. Underlying these, in brown sand, was a large quantity of Nutimik Focus remains, and deeper still, in a dark old humus called Levels 4 to 6 during the excavations, were a few distinctive artifacts that had been assigned to the Whiteshell Focus.

The other sites excavated were not stratified. The excavation of the Alexander's Point site (EdLb 1) at the mouth of the Winnipeg River consisted of a single trench 10 feet wide and about 30 feet long to a depth of about nine inches. Here Selkirk Focus remains were found in association with early French and English trade goods. The Sturgeon Falls dig (EaKv 2), located on the north shore of Nutimik Lake, just east of

Sturgeon Falls on the Winnipeg River across from Cemetery Point, consisted of a long narrow trench (5 by 105 feet) that contained Selkirk Focus remains without historic goods. Between the Sturgeon Falls site and the Alexander's Point site on the Pinewa channel of the Winnipeg River, an area 15 by 25 feet revealed similar artifacts at the Waulkenin site (EbKw 3).

The Toukko site (EbKw 2), a quarter of a mile south of the Waulkenin site on the Pinewa channel, revealed Manitoba Focus remains in a 5- by 25-foot trench. Similar artifacts were found in the Stott Mound and village (DiMa 1) near Brandon,<sup>1</sup> in the Rosser Mound (DiLi 1) about 25 miles northwest of Winnipeg,<sup>2</sup> and in the upper levels of the United Church site (DhLs 3) along the north shore of Rock Lake. The Anderson site (EbKw 1), the type component of the focus of the same name, was located a quarter of a mile east of the Toukko site. Here a trench 15 by 25 feet was exhumed next to the shore of the channel. The type component for the Larter Focus was located on the west bank of the Red River about half-way between Winnipeg and Lockport. At this site (EaLg 1) an area 15 by 30 feet was exhumed as well as eight 5-foot squares.

The following table reveals the correlation of the stratified layers of Cemetery Point and Lockport as well as the chronological position of the

Lockport site (EaLf 1)	Cemetery Pt. site (EaKv 1)	Single component site	Total sequence
Levels 1, 2	Level 1	Alexander Pt. (EdLb 1)	Selkirk Focus
		Waulkenin (EbKw 3)	
Levels 3, 4		Sturgeon Falls (EaKv 2)	
Level 5	Mixed level 2	Stott Mound (DiMa 1)  Rosser Mound (DiLi 1)  Toukko (EbKw 2)	Manitoba Focus
Levels 6, 7 Level 8	Level 3		Nutimik Focus
Levels 9, 10		Anderson site (EbKw 1)	Anderson Focus
Level 11 Level 12		Larter (EaLg 1)	Larter Focus
	Levels 4-6		Whiteshell Focus

<sup>1</sup> MacNeish, 1954.

<sup>2</sup> Rand, W. H., 1941.

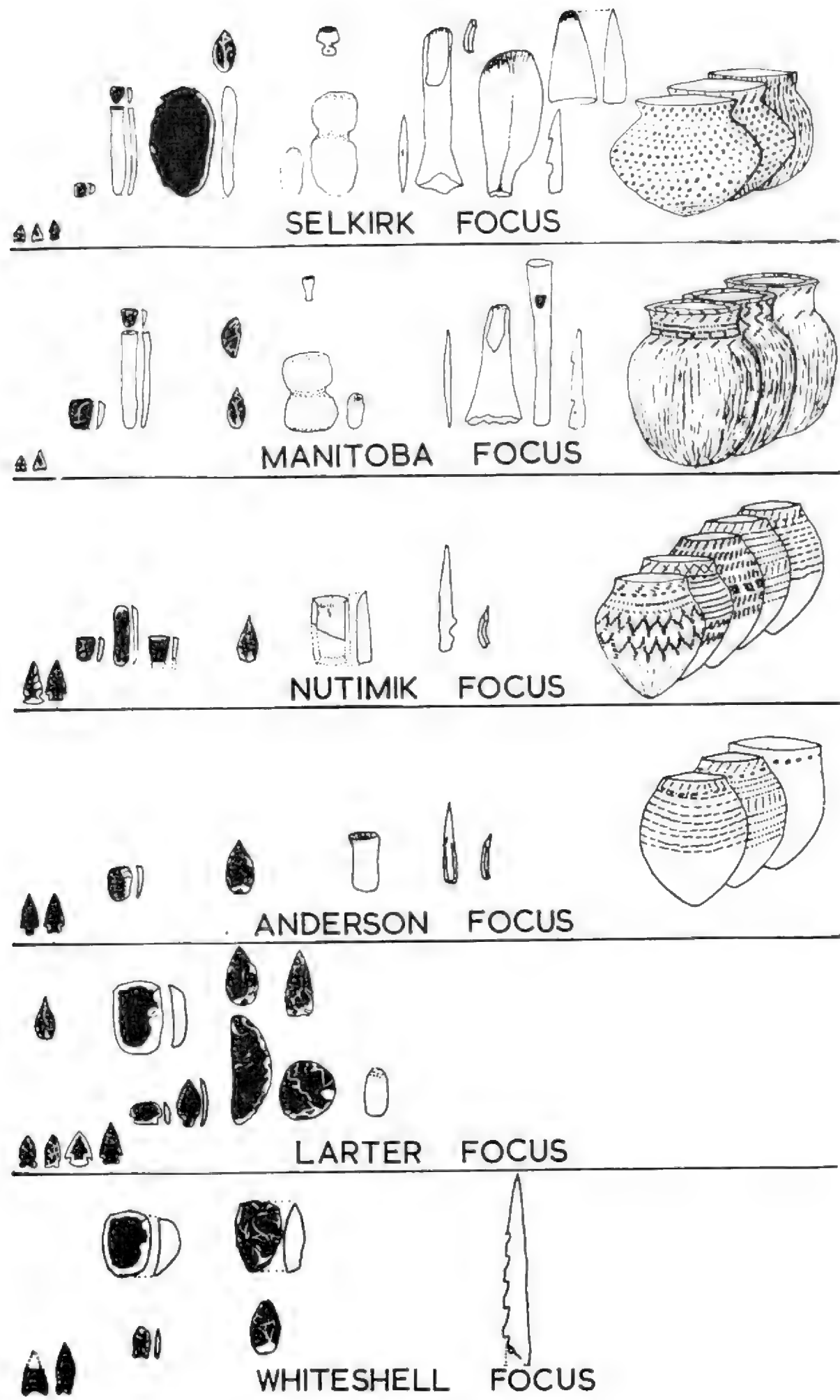


Figure 2. Drawing of diagnostic artifact types in the sequential foci of southeast Manitoba.



single-period sites. In the next section is presented a summary of the archaeological complexes found in the above-mentioned excavations. A complete report of the various artifact types and the details of the excavations and of the geology and the wider cultural relations will appear as a bulletin of the National Museum of Canada.

### THE WHITESHELL FOCUS

The only manifestation of this cultural complex occurred in the lowest levels of the Cemetery Point site in the Whiteshell region of eastern Manitoba. Stratigraphically it represents the earliest remains of man in this region. Cross-dating tentatively indicates that this focus is 3,500 to 5,000 years old.<sup>1</sup>

The site is situated on ancient beach sands above the shore of Lake Nutimik in the forested region of eastern Manitoba. Since all the bone associated with the archaeological material was that of buffalo and almost no remains of forest animals occurred, it has been suggested that this region was perhaps a grassland at the time of this early occupation. The small area covered by the refuse of Whiteshell Focus remains indicates that the groups were small. The lack of depth of refuse and the lack of osteological evidence of their being a hunting group imply that they were nomadic.

The buffalo bone, in conjunction with projectile points and a number of tools used in the scraping of skins, indicates that these people were primarily hunters. However, a single barbed antler point that may have been used to spear fish, and the location of the site along a waterway at present abundant in fish, certainly suggest that their hunting activities were supplemented by fishing.

One of the most important activities of this group was flint knapping. For the most part, material used in chipping is chert, quartz, or quartzite from the general area of the site, but a few chips and tools are made from a grey chalk chert that outcrops along the Red River just above its delta. Blades or projectile points were first chipped from quarry blanks or large flakes by percussion flaking. They were then rounded into their various shapes and their edges finished by pressure flaking. Scrapers seem to have been made mostly by pressure flaking along one or more edges of a large flake, flat on one side.

The projectile points are fairly narrow and all lanceolate-shaped with concave bases. Some of them have been ground along their lateral edges near the base. The size of projectile points suggests that they were not arrow points but either dart or spear points.

The large ovoid blades may have been hafted on some sort of handle for use as daggers or knives.

The thin flakes with retouching on one of their larger sides are often called side-scrapers. Actually they could just as well serve as some sort

<sup>1</sup> Wheeler, 1952. Kulp, Feely, and Tryon, 1951, date Signal Butte 1a, with a complex very much like the Whiteshell Focus as being  $3445 \pm 120$  years old; whereas Libby, 1953, dates the equally similar Muddy Creek site, sample C702, as being  $3540 \pm 220$  years old.

of all-purpose cutting implements or skinning knives. None of them have any provision for hafting. One spoke shaver might also have been used in skinning, but it might just as well have served as some sort of wood-working tool.

Three kinds of implements, however, were probably used for skinning or fleshing of hides. One of these types of implements is circular-oval in outline, plano-convex in cross-section, and relatively large in diameter ( $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches). The dorsal side usually bears percussion flaking and finer retouching along part of the edges. Because of their convexity they would be most difficult to haft. The second variety of scraper is roughly rectangular in outline, with a ventrally flat surface that has relatively steep sides leading to a flat top and has steep retouching on the dorsal surface of one of the ends. These end-scrapers could have been hafted, and probably were, with the narrow end, opposite the retouched end, being inserted in some sort of wood or bone handle. The final scraper type seems to have been made from projectile points that had their tips reworked by bifacial chipping to form convex scraping edges. Since their bases are convex with the basal edges ground for dart shafts, they could have been hafted easily on some sort of split stick or slotted bone.

The large number of scrapers indicate that leather- or skin-working was probably an important activity. Of course some of these scrapers also could have been used to abrade bone or wood or to remove marrow from bone.

The multi-barbed unilateral antler point yields considerable information about these ancient peoples. First of all, it was cut from a piece of antler, probably of a moose, and is the only osteological material that is not from a buffalo. Though some of the edges are ground, most of its flat surfaces have been scraped, perhaps with one of the end-scrapers. It has a long tapering point, and its five barbs are along one edge. These barbs, although oblique in front and back, are flat on top. Such a barb could not have been used on a leister, but only on a spear. The fact that the squared base of the point is thinned and has a line hole in it suggests that the point was detachable from the shaft and that it fitted into some sort of socket or groove at the end of the shaft. The hole indicates that a line was attached to the head, by which the spearer could draw in the fish once the detached head was stuck into it. The size of the point, 9 inches in length and  $1\frac{1}{4}$  inches maximum width, suggests that it was used for spearing only large fish such as sturgeon. As the line hole in the antler point has been drilled from two sides, we may conclude that the people of the Whiteshell Focus had some sort of hand drills.

This earliest culture has widespread affiliations with archæological complexes found on the northern Plains. The Lakeshore culture on Rock Lake, Manitoba, described by C. Vickers,<sup>1</sup> the earliest level of the Mortlock in Saskatchewan,<sup>2</sup> Cheyenne Falls Focus in South Dakota,<sup>3</sup> the lower part of Occupation 2 in Birdhead Cave in Wyoming,<sup>4</sup> Level 1-A at the Signal Butte site in western Nebraska,<sup>5</sup> and various sites

<sup>1</sup> C. Vickers, personal communication.

<sup>2</sup> B. Wettlaufer, personal communication.

<sup>3</sup> J. Hughes, 1949.

<sup>4</sup> Bliss, 1950a.

<sup>5</sup> Strong, 1935, Bliss, 1950b.

in the Keyhole Reservoir in Wyoming<sup>1</sup> have in common with the Whiteshell Focus such diagnostic traits as McKean Lanceolate projectile points, spoke shavers, and snub-nosed scrapers, as well as more general traits such as ovoid blades, choppers, side-scrapers, and large crude end-scrapers. There was also some evidence that the Whiteshell Focus gradually develops into the Larter Focus.

#### THE LARTER FOCUS

Components of the Larter Focus were unearthed in Level 11 and Level 12 of the Lockport site and at the Larter site. The former two occupations are situated in the lower part of the low terrace next to the Red River; the Larter site, on the other hand, is on a high terrace, which at the time of its occupancy may have been next to the Red River.

The dating of the Red River low terrace by Carbon 14<sup>2</sup> and the cross-dating of the Larter type of materials suggest that these people lived in eastern Manitoba 2,500 to 3,500 years ago.<sup>3</sup> Though this area is now covered by aspen forests, the presence of only buffalo bones in all three components indicates that it was probably a grassland during Larter times.

The thin occupational stratum covering a limited area at Lockport (Levels 11 and 12) and a floor in the lower levels of Larter suggest a short occupancy by a small group—some sort of small nomadic band. However, the rather deep refuse at Larter and the large size of the site would seem to demonstrate either that occasionally a large gathering of the smaller bands took place, or that the small bands repeatedly returned to this site over a considerable length of time. Perhaps both suppositions were true to some extent.

On the basis of the large numbers of buffalo bones, projectile points, and scrapers, it may be inferred that the subsistence of the Larter peoples was based primarily on hunting. The few fish bones from Level 11 of Lockport indicate that fishing was of minor importance. Some meat was roasted on hot rocks placed on fire embers. The large number of cracked bones and cracked bones with the interior section cleaned out reveal that the marrow was also an important food item. Perhaps the grooved and ungrooved hammerstones and choppers were used to crack these bones, and perhaps some of the scrapers served to gouge out the marrow.

As with their predecessors in the area, flint knapping was an important industry. The dominant material utilized was a grey, chalky chert that outcrops along the Red River, but a few pieces of quartz, quartzite, and bluish-black granite from the Precambrian Shield were also used. The occurrence of rough nodules and large bifacial ovoid or semi-lunar quarry blanks shows that some of the raw material was brought to the site and then fashioned into tools. The technique of manufacture seems to have been much the same as that of the Whiteshell peoples.

Projectile points are of a size that could have been used on spears or darts. Though there are a few lanceolate ones like those of the previous horizon, and many are large triangular or ovoid, most of them have corner-

<sup>1</sup> Wheeler, 1954.

<sup>2</sup> Libby, personal communication. Specimen C723 from the bottom of the low terrace of the Red River near Robbin, Minnesota, was dated as  $2684 \pm 200$ .

<sup>3</sup> Wheeler, 1954, and Libby, 1952, who dated a similar complex from the Keyhole Reservoir in Wyoming, sample C668, as being  $2790 \pm 350$  years old.

notches and four have side-notches, indicating probably a different method of attaching the point to the shafts. The fact that points represent 25 per cent of the total artifacts emphasizes both the importance of their manufacture as well as the importance of hunting.

However, the dominant artifacts of this horizon (47 per cent) are scrapers, indicating that leather-working was a very important industry. Of course some of these scrapers could have been used to gouge out marrow, shave wood, and abrade bone. Many of the scrapers are large and crude and most difficult to haft. Some of these are split cores, oblong in outline, with dorsal retouching along either their longer or shorter side; others are circular in outline with retouching all around their dorsal edges. There are two varieties of end-scrapers that could have been inserted into some sort of handle. Some of these are oval in outline and plano-convex in cross-section and are retouched along one of their shorter ends; others are merely long flakes with retouching along a shorter end. Three end-scrapers are notched and could have been hafted to some sort of split or slotted wood or bone handle.

One fragment of a point, one triangular point with a very narrow tip, and some of the pointed side-scrapers may have been used to drill or pierce holes in skins, bones, wood, and the like.

Flat flakes with retouching along one of their narrow sides were possibly all-purpose cutting tools and might have been used as scrapers. However, bifacial chipped blades seem to be the most numerous kinds of tools used for cutting. Most of them are tear-drop shaped. These and large triangular ones may have been end-hafted. Two half-moon shaped ones occurred. They may have been hafted into the side of some sort of handle, and their convex edge may have been used for cutting. Bifacial chipped blades that are round or oval occurred also. Exactly how they were hafted (if they were) is difficult to comprehend.

A few large, roughly oval-shaped blades have battering along one of their edges. These may have been choppers. Three cobbles with pecking on one of their ends, and one pebble with a pecked groove three-quarters of the way around its body, plus pecking on one end, probably are hammerstones.

Like the previous horizon in eastern Manitoba, Larter has its closest affiliations to complexes in the Northern Plains such as the lowest levels of Pictograph Cave near Billings, Montana,<sup>1</sup> the Jackson Narrows Focus in the Angostura Basin in South Dakota,<sup>2</sup> and Level 1-C at Signal Butte in western Nebraska.<sup>3</sup> Common to all four foci are the McKean Lanceolate, Larter Tanged, and Lockport Corner-notched points as well as the more general traits, such as tear-drop shaped and sub-triangular projectile points and knives; oblong, ovoid, and circular bifacial blades; choppers; plano-convex end-scrapers, split-core end-scrapers; pointed-flake side-scrapers, and flake side-scrapers. Certainly this complex of traits indicates there is a cultural nexus between them. Furthermore, the similarity of projectile points and scrapers is evidence that the Anderson Focus developed from Larter.

<sup>1</sup> Mulloy, 1952.

<sup>2</sup> Hughes, 1949.

<sup>3</sup> Bliss, 1950b.

## THE ANDERSON FOCUS

Artifacts of the Anderson Focus appeared in Levels 9 and 10 of Lockport along the Red River and at the Anderson site at the edge of the Pinewa Channel.

On the basis of a general similarity in pottery and projectile points of this horizon to those of the Hopewellian time period in the midwestern United States, dates of from 1,500 to 2,500 years ago have been tentatively assigned to this focus.

The Anderson site appears to have been but a brief occupation by a small group, and our survey revealed few large sites of this cultural complex. Like their predecessors in the region, the Anderson Focus people apparently lived in nomadic bands. The bone material from the lower levels (9 and 10) of Lockport shows that their subsistence was based upon hunting and fishing, and shells indicate there was some food-gathering. Identification of the bones reveals that the remains of birds and forest animals (beaver, hare, and deer) are intermingled with the fish and buffalo bones. These food fragments not only tell us what they ate but also allow one to infer that perhaps by this period, at least, the forest had invaded the area.

An important new industry appears in this horizon: pottery-making. Initially, crushed rock was kneaded into the clay as tempering material. The pots all seem to have been made by the coil method. The surface of vessels was usually smoothed, but a few sherds bear loose cord-wrapped paddle impressions. The dominant form was that of a cocoanut, with pinched vertical or slightly outflaring orifice. A few pots were undecorated except for exterior irregular punctations, spaced about an inch apart around the rim. Most pots, however, have decoration on the exterior upper half. There were three main techniques of decoration. One was made by impressing some sort of toothed object into the wet clay to make a dentate stamp. On the shore of the river at Lockport, Peter Grant picked up a long sliver of bone with closely-spaced notches along one of its edges. When this is pressed into wet clay it makes dentate-stamp impressions very similar to those found on the pottery, and it may very well represent the sort of toothed object used in decorating the pottery. Designs on the pottery usually consist of horizontal closely-spaced lines of dentate on the body, with oblique lines on the rim or horizontal bands of short vertical or oblique dentate impressions that encircle the upper body and rim. The second method of decorating the pots was by impressing some sort of stylus, rectangular in outline, into the clay so that lines are made by a series of adjacent or overlapping punctates. The exact tool used to make these linear punctates is unknown. The dominant motif is a series of horizontal lines of linear punctates around the upper body and parallel oblique lines on the rim, with a line of irregular punctates at the junction of rim and body. The final kind of decoration was made by impressing the clay with some sort of object which had closely-spaced cords wrapped around it. Studies of similar sherds from later horizons suggest that these so-called cord-wrapped stick impressions were probably made by impressing the edge of a cord-wrapped paddle into the wet clay. The designs made by this technique seem to be very similar to those made by means of linear punctates.



These pots were undoubtedly used for storage and the drawing of water. Perhaps they were also used for cooking, but there is no evidence of such, for unlike those from later horizons, none had carbon adhering to their interior surfaces.

Flint knapping, done in much the same manner as that of the previous horizons, was still an important industry. However, there are proportionally fewer projectile points than in previous foci. Possibly this indicates a greater reliance on fishing and some sort of snaring of animals. The projectile points are corner-notched like some of those of Larter, though a few have poorly-made straight stems. Their size suggests they were dart or spear points.

That leather-working was still an important industry is demonstrated by the finding of end-scrapers. Though there were some large plano-convex ones that could not be hafted, most of them could have been inserted into some sort of notch or slot in a handle. The haftable ones are roughly triangular or truncated in outline and almost all are plano-convex in cross-section, though one with a flat top and one with a keeled dorsal surface were found. Thin flakes with retouching were still very numerous and probably served a variety of functions besides that of scraping. Beaver teeth, ground to points, may have been used for piercing the leather or etching designs on it.

Blade fragments were fairly numerous, but only one complete blade was uncovered. It is large ( $4\frac{3}{4}$  inches long) and roughly tear-drop in outline. It may have been end-hafted.

The various kinds of chert associated with these cultural remains suggest fairly wide cultural contacts and perhaps trade. Besides the white chert from the Red River and quartz and quartzite from the Precambrian Shield, brown chalcedony from the Knife River in North Dakota and a reddish chert (a jasper) that is commonly used for artifacts in southern Saskatchewan were found.

The pottery from the Laurel Focus of northern Minnesota and that of the Anderson Focus are almost identical.<sup>1</sup> Further confirmation of a connection between the Laurel and Anderson foci is the presence in both of beaver teeth cut obliquely across the labial surface so that they form points, straight-stemmed and corner-notched points, snub-nosed scrapers, split-bone awls, leaf-shaped knife blades, and flake side-scrapers. Thus Laurel and Anderson seem closely linked, but there is a major difference in that Laurel has a burial mound complex and a host of bone tools not present in the Anderson Focus. As far as Manitoba is concerned, there is considerable evidence to show that the Nutimik Focus developed from the Anderson Focus.

#### THE NUTIMIK FOCUS

Levels 6, 7, and 8 of the Lockport site, as well as Level 3 of the Cemetery Point site, belong to this horizon. No individual "pure" sites of the Nutimik Focus were excavated, because we did not realize, while we were

<sup>1</sup> Wilford, 1941.



in the field, that these manifestations represented a distinct cultural complex. There is no reliable way of dating this focus; therefore the dates of from 1,000 to 1,500 years old are estimates.

Both components occurred along bodies of water: the Red River and Lake Nutimik. The presence of bone material suggests that the flora and fauna during occupation of these people were the same as they are today. Since there were no well-defined floors in any of the Nutimik sites, it is difficult to speak about the size of the groups of inhabitants. However, at both Lockport and Cemetery Point, as well as at sites from which we have surface collections, Nutimik artifacts are spread over large areas. Perhaps the population, as well as the size of the group, was larger than in the previous horizons. Since the bones still show them to have been hunters, one would suspect that they were nomadic or at least semi-nomadic.

The predominant bones in the Nutimik levels of Lockport were those of fish. Net impressions on pottery of this horizon suggest one method by which they were caught. Buffalo bones, though still present, are outnumbered by bones of deer, hare, beaver, bear, fox, and turtle. These were certainly hunted or snared. Mollusc shells are fairly numerous, a fact which indicates some food-gathering.

As in the previous horizon, pottery-making is an important industry. The method of manufacture of much of the pottery is the same. However, some of the pots, though initially made by the coiling method, were later struck with a cord-wrapped paddle (perhaps to thin their sides). A few sherds have the same dentate, linear punctate, and punctate decoration described for the Anderson Focus. Also, the cord-wrapped paddle-edge decorated pottery is present, but it is much more numerous than it was in the earlier horizon. Although some of it displays the simple designs of the previous period, much of it at this time is vertically rockered and sometimes ornamented with horizontal bands composed of short oblique impressions in conjunction with the horizontal lines.

Most of the pottery, however, belongs to four new types. One of these types has smooth surfaces that bear a thin wash of red ochre on them; another bears net impressions. The net impressions are indistinct, but all show a mesh of between one-quarter of an inch to half an inch wide. The other two varieties are better represented, particularly so at Cemetery Point. One of these is decorated by incising. The upper half of the body bears horizontal parallel lines, but rims may be blank or may have parallel oblique lines or widely-spaced cross-hatching. A line of irregular punctates usually encircles the bottom of the rim. A few sherds of this type have plain rockering just below the horizontal incised lines. The final type has horizontal bands of impressions about half an inch wide encircling the upper half of the body. The bands are composed of short, closely-spaced oblique impressions that seem to have been made by the edge of a scallop shell. A few sherds of this type have a band of closely-spaced vertical lines just below the lip, and one pot has two bands of oblique plats composed of horizontal scallop shell impressions between the horizontal bands of closely-spaced oblique scallop-shell impressions.

Only a few body sherds of this horizon have on their interiors some adhering carbon to suggest that cooking was done in pots. And since most of them do not have adhering carbon on their interiors, it seems reasonable to conclude that most of the vessels of this horizon were not used for cooking but for storage or for water carrying.

Though examples of pottery-making are both numerous and distinctive for this horizon, the activity was probably no more important than flint knapping. Blades and projectile points were probably made from quarry blanks that were chipped into shape by percussion flaking. The blades were finished by pressure flaking along their edges. They usually were tear-drop shaped in outline and may have been hafted at the end of a handle for knives or daggers. The projectile points, though they may have been originally made from percussion-flaked blanks, usually have pressure flaking along their edges and on their surfaces. These points are either corner-notched like those of the previous horizon or side-notched. Their size and weight suggest they were used as dart or spear points for hunting.

At Cemetery Point in the Nutimik level there were three prismatic or lamellar flakes; these showed a very different technique of flint chipping. All were struck from a specifically prepared polyhedral core (i.e., a conical core with fluted sides). All have retouching along their lateral edges as well as wear flakes. They also show polishing or wear or grinding along their dorsal ridge or ridges or keels. This polishing, I believe, was caused by abrasion by the edges of the slot of the handle into which they had been set. From the grinding as well as comparative archæological evidence, I believe it is valid to conclude that these prismatic flakes were set into the side of handles as the cutting edge or edges for side-bladed knives. The fragment of a beaver-tooth, whittled to a point, might have been the tool used to make the slot for these insert blades.

Superficially similar to these retouched lamellar flakes are long flat flakes with retouching on one of the long dorsal edges. These are much the same as the all-purpose tools, often called side-scrapers, that appeared in the previous horizon.

End-scrapers being fairly numerous indicate that skin-working was an important industry. All are roughly triangular in outline and small enough to have been inserted into some sort of handle. Some of them are plano-convex in cross-section; a few are flat on top, and others are keeled or have a dorsal ridge. There is a tendency for them not only to have steep retouching on their convex ends but to have less steep retouching along their contracting sides.

One prismatic flake is pointed; two have retouching on either side of their points and may have been used as drills.

Impressions of the cord-marked and the cord-wrapped paddle-edge pottery reveal that a two-strand clockwise-twisted string and single strand thongs were known. Though they were used in decorating the pottery, they may also have been used for nets and for sewing.

One fragment of a polished stone adze was uncovered. Its sides are vertical; one surface is convex and the other side leading to the cutting edge is slightly concave. This adze was undoubtedly hafted and used in wood-working.

A few pebbles, with battering or pecking on one of their ends, functioned as hammers.

One group of fire-cracked rocks, lying on a burned area, indicates that some of the food was roasted, and conical pits found at Cemetery Point may have served to store the food.

The ceramics of the Nutimik Focus are similar to those of the Rock Lake Focus of central Manitoba and to those of the Anderson and Palmo sites of the Howard Lake Focus of Minnesota.<sup>1</sup> Besides having ceramics in common, lamellar flakes, large corner and side-notched points, triangular end-scrappers, ovoid and triangular blades, and side-scrappers occurred in all three foci. Thus these three foci are related, but a number of traits justify considering each as separate cultural entities. The cord-marked and cord-decorated pottery may represent some sort of tenuous relationship between the Nutimik Focus and the Manitoba Focus. However, the present evidence for eastern Manitoba would seem to indicate that the Manitoba Focus either did not develop from the Nutimik Focus or, if it did, that the intervening steps have still not been found.

#### THE MANITOBA FOCUS

Level 5 of Lockport, the Toukko site, and the Rosser<sup>2</sup> Mound are considered to be components of the Manitoba Focus in southeastern Manitoba, but the Stott Mound<sup>3</sup> and village, the Krieger site,<sup>4</sup> the upper levels of the Avery site,<sup>5</sup> and the United Church site are excavated manifestations of this focus in the south-central part of the province.

There is some evidence that the Manitoba Focus represents remains of the Assiniboine. However, as far as eastern Manitoba is concerned, they seem definitely prehistoric. The fact that this cultural complex at Lockport is under the flood layers, perhaps representing the long wet period from A.D. 1350 to 1400, indicates that in this region it may date from before 1350.<sup>6</sup> On the basis of this, an A.D. 1000 to A.D. 1350 date has been tentatively assigned to the remains of the Manitoba Focus in eastern Manitoba. Bones with this focus indicate that the flora and fauna were the same as they are today.

The Lockport and Toukko components were along the edges of large bodies of water, but the Rosser Mound, some of the sites found in survey in this region, and some of the sites in south-central Manitoba show that many sites are some distance from large bodies of water and are often along the sides of hills or escarpments. Though the Toukko site represents a short occupation by a small group, the occupation of this type at Lockport covers a large area (1,000 by 200 feet) and the village associated with the Rosser Mound covers an area 200 yards by 200 yards; whereas the excavated sites in central Manitoba are of equal size. Thus the people of the Manitoba Focus may have characteristically grouped together in large bands (perhaps with as many as 200 people). However, in spite of the large extent of the site, nowhere is the refuse very deep. This, plus the fact that subsistence is mainly based on hunting, suggests that they were semi-nomadic.

<sup>1</sup> Wilford, 1944.

<sup>2</sup> Rand, 1941.

<sup>3</sup> MacNeish, 1954.

<sup>4</sup> Vickers, 1946.

<sup>5</sup> Ibid.

<sup>6</sup> Schulman, 1953, Fig. 6.

In Level 5 of Lockport and in the Toukko site the dominant osteological materials are fish bones. Thus both these sites were mainly fish camps. The unilateral barbed bone points indicate that some fish were speared, and a few sherds with fabric impressions suggest that they were also caught in nets. As the bones of animals are still numerous, hunting was important. An abundance of buffalo bones in the components of this focus farther to the west suggests a subsistence pattern based mainly on hunting, and the presence of small projectile points with the bones shows that the hunting was done with the bow and arrow. At the Stott site near Brandon there is evidence of the stampeding of the buffalo over an embankment.<sup>1</sup> A correlation between the rise in the quantity of bird bones and the presence of arrow points at Lockport is perhaps significant. It is possible that the use of the bow and arrow may have increased the efficiency of hunting techniques so that fowl became an important item in the diet. Fresh water shells in Level 5 at Lockport reveal that the Manitoba Focus people did some food-gathering.

Since sherds are both numerous and distinctive, pottery-making was an important industry. The technique for making the pottery was different from that of the previous horizons. Though crushed rock was still put in the clay as tempering material, the pot was formed in a different manner. The vessels appear to have been made by paddling a hollow or coil-made cup-shaped mass of clay with a cord-wrapped paddle. Gradually this mass was paddled thin and thereby enlarged until a round body with thin walls was formed. The inside was then smoothed, and a brushed neck with a thickened rim, probably made by the coil method, was welded to the body. Next, the pots were decorated by the edge of the cord-wrapped paddle. On the lip and on the exterior and interior rims, parallel oblique impressions were made. On the brushed necks were a number of other designs, the most popular of which were horizontal lines encircling the neck with a band of circular exterior punctates, herringbone impressions with circular exterior punctates, and a single band of exterior punctates in the brushed area. The pots were fired in some sort of open hearth.

Since many sherds have carbon adhering to their interiors, I suspect that the main use of the pots was for cooking. They also may have been used for drawing water and for storage.

Though the general technique of flint knapping is much the same as that of earlier horizons, the end products are different. Projectile points seem to have been made from relatively thin flakes. Percussion flaking, if present in their manufacture, appears to have been employed mainly in obtaining the flake. The thin flakes always have retouching along their edges and in many cases show pressure flaking on their surfaces. In shape they are isosceles or equilateral triangles, with or without small side-notches; in size they are small (less than one inch long). Most probably they were arrow points.

The tear-drop and half-moon shaped blades appear to have been made from large flakes or quarry blanks and bear percussion flaking on their surfaces. Their edges, as well as part of their surfaces, have pressure

<sup>1</sup> MacNeish, 1954.

flaking on them. The tear-drop shaped blades may have been end-hafted for knives, daggers, or lances; and half-moon shaped blades, on the other hand, may have been side-hafted for knives.

One smooth section of a rib bone with rounded polished ends was uncovered by Hlady in the Manitoba Focus levels of Lockport. This may have been used as a flaking tool in the manufacture of flint artifacts.

There is a variety of tools that may have been connected with the working of skins. As in all previous horizons, retouched flakes are very numerous and may have had various functions besides that of scraping or skinning. End-scrapers are numerous and are small and haftable. At the Avery and Stott village sites in central Manitoba, polished bone handles, with one end rounded and the other squared and slotted for hafting the end-scrapers, occurred. Unfortunately none were uncovered in excavation in eastern Manitoba, though this kind of polished handle was collected from the shore of the Lockport site. The end-scrapers themselves are most often flat or convex ventrally with steep retouched sides, flat dorsal surface, and triangular outline. A few are triangular in outline and plano-convex in cross-section; others were round or oval in outline and plano-convex in cross-section. However, besides these stone-tipped fleshers there are bone fleshers. The one fragment from Lockport is made from a split deer leg-bone, with one end of the split section ground on one side to a wedge-shaped scraping edge.

Split bone awls may very well have been used to pierce leather or skins. The two-strand clockwise-twisted thongs or string, which made the impressions on the pottery, could have been used to sew the leather or skins together. The double-pointed bone object from the Rosser Mound may very well have been a needle for sewing.

In the Lockport refuse there also occurred a number of beaver teeth, which had their lingual tips artificially abraded. Beaver teeth abraded in a similar manner are found set in straight or "L"-shaped handles and are called "crooked knives" among the Assiniboine, Cree, and many of the northern Athabaskan groups of Canada. Among these groups the crooked knives are used as wood gouges and gouges for making slots in snow-shoe rims. Perhaps the abraded beaver teeth were used in the same manner for the same purpose.

As may be seen from the above data, the making of bone tools was an important industry. Most of them seem to have been first cut into their desired shape and then polished. Besides awls, fleshers, unilateral barbed points, beaver teeth, needles, and flakers, bone whistles were made from the leg-bones of birds. One possible fragment occurred at Lockport in Hlady's excavation, but the whistles are very common in Manitoba mounds. They may have had some sort of special ceremonial significance connected with the burial customs.

Three tubular objects ground out of steatite occurred in the Rosser Mound. Since one of them is fire-blackened on its interior, I believe they were smoking pipes, though they very well could have been a shaman's sucking tube.



Artifacts made by pecking are pebble hammerstones and full-grooved mauls. Both may have served to smash bone so the marrow could be scooped out, but the former may also have been used in working flint and the latter could have served to drive tent pegs (if they had tents).

Though much of the flint and other materials used were of local origin, some of it is not. Some of the flint is brown chalcedony from North Dakota, but the tubular columella shell beads are made from the centre part of Gulf of Mexico conch shells. Thus the trade contacts of this group extended over a large area.

Besides this evidence of the technology of these ancient people, the burial customs give some information about the non-material aspects of their culture. First of all, the fact that mounds seem to have been built for one special individual hints that certain people had a higher status than others. Perhaps these individuals were chiefs of some sort. Also, since the mounds represent a fair amount of work by a number of individuals, one may hazard a guess that some degree of formal organization and a director of this labour existed.

The dead were disposed of in two ways. More important personages were placed in a sitting position in cylindrical pits covered by logs and then mounds. Others seem to have been left in the open (perhaps on scaffolds) until the flesh was gone, and then placed in cylindrical pits which were covered with logs and earth. As a rule, both these forms of burial occurred in the same mounds. In many Manitoba mounds there are firepits near the burial pits, remnants perhaps of some sort of burial rites, and always burial furniture—an indication of belief in an after life.

That the Blackduck Focus and the Manitoba Focus are related is indicated by a host of traits in common.<sup>1</sup> The pottery is almost identical, as are the projectile points. Long bone fleshers, unilateral barbed bone points, whistles made from bird leg-bones, antler flaking tools, flake side-scrappers, triangular end-scrappers, bone awls, ovoid blades, and pebble hammerstones are common to both. Although the burial complexes of the two are very similar, they are not identical. As I have indicated in the Stott Mound report, there is considerable evidence that the Manitoba Focus represents the material culture of the Assiniboine.<sup>2</sup> Thus it may be that the prehistoric culture of the Assiniboine spread from northern Manitoba through southwestern Ontario into southern Manitoba. In eastern Manitoba the Selkirk Focus, because of its many trait differences, seems to represent a replacement of the Assiniboine by the invading Cree.

#### THE SELKIRK FOCUS

Six manifestations of the Selkirk Focus were excavated. They are the Alexander's Point site, the Waulkinen site, Levels 1 and 2 from Zone A of Lockport, Levels 3 and 4 from Zone B of Lockport, Level 1 of Cemetery Point, and the Sturgeon Falls site. Surface collections reveal that remains of these cultural complexes are more numerous than any of the others in

<sup>1</sup> Wilford, 1945.

<sup>2</sup> MacNeish, 1954.



southeast Manitoba and that they are totally absent from south-central and southwest Manitoba. Sherds from northern Manitoba and northern Saskatchewan appear to be closely related to those of the Selkirk Focus.

There is good evidence from the Alexander's Point site for connecting this cultural complex with the Cree tribe. I have assumed that the other related manifestations represent the prehistoric Cree. Levels 3 and 4 of the Lockport site are in water-laid sands, which I believe represent the wet period from 1350 to 1400.<sup>1</sup> For the present, 1350 is considered the beginning date for the Selkirk Focus in southeast Manitoba. Seriation of pottery of the various excavated Selkirk Focus manifestations with the historic Alexander's Point site as a starting point, as well as the stratigraphic trends from Levels 4 to 1 at Lockport, indicates a tentative sequence of the components of this focus. This sequence is, from Early to Late: Sturgeon Falls, Cemetery Point, Levels 3 and 4 of Lockport, Levels 1 and 2 of Lockport, Waulkinen, and Alexander's Point.

All sites of this focus occur along waterways. Most of the sites cover a large area (100 by 50 yards), and the refuse layers are usually thin. At Lockport and Sturgeon Falls sites there are a number of fireplaces in a single occupation layer. Thus I would estimate that at these sites a number of families were living together. Since at Lockport the refuse is uniformly thin and since in the sand layers of Zone B there were thin mantles of refuse and fish bones, it is probable that these layers represent temporary occupations. Thus it is concluded that the Selkirk Focus was composed of fairly large semi-nomadic bands.

The dominant skeletal materials at all these sites are fish bones. The fragments of unilateral barbed bone indicate that some were speared, but the babiche fabric impressions on the pottery suggest others were caught in nets. However, besides fish bones there are deer, buffalo, moose, hare, beaver, bear, wolf, muskrat, and bird bones in the ancient garbage of the Selkirk peoples. Thus hunting and trapping were of some importance. The small arrow points tell us the manner in which the hunting was done. However, such animals as muskrat and hare were more likely caught in snares or traps rather than shot with the bow and arrow. The fresh-water clam shells, the carbonized wild plum pit, and the burned seeds (of an unidentified variety) from Lockport give some clues as to the variety of food-collecting. It is perhaps valid to infer from the ethnographic data on the Cree that this group at the time of the Selkirk Focus also collected wild rice.

The hearths filled with fire-cracked rock and the numerous sherds with carbon adhering to interior surfaces show that whereas some meat was roasted, other food was boiled. The large bell-shaped cache pits lined with bark, which often contained bone and charred seeds, illustrate the manner in which food was stored. Perhaps the scapula hoes were used to dig both the hearths and bell-shaped storage pits.

There is some uncertainty in the ethnographic reports whether the Cree made pottery. However, the testimony from the artifacts of the Selkirk Focus, representing the remains of the prehistoric and early historic Cree, is that they did make pottery. Furthermore, if one can

<sup>1</sup> Schulman, 1953, Fig. 6.

judge from the large proportion of sherds at Selkirk manifestations, pottery-making was an important activity. In making the pots, the grit and quartz, sand, or crushed rock was first mixed with the clay. Then some sort of thick modelled cup or coil-made pot was beaten into shape by the paddle-and-anvil method. The paddle was usually covered with tightly-knit woven babiche, but occasionally (particularly in the early stages of the Selkirk Focus) a cord-wrapped paddle was used. The preferred shape has an out-turned short straight rim on a squat body with a rounded base and slightly angled shoulders. All vessels have smooth interiors, but only occasionally do these pots have smoothed exteriors, and the fabric impressions or cord-marked impressions are visible for the most part. Some pots have fabric-impressed or cord-marked lips, but many are smooth. Most of the ceramics are undecorated. However, some lips have notched or oblique cord-wrapped paddle edge impressions on them, though an even lesser number also have parallel oblique cord-wrapped paddle impressions on the rims with elongate punctations at the junction of the rim and body. One other type of decoration occurs (mainly at the Sturgeon Falls site); it consists of bands of elongate or semi-lunar punctates around the rims and cord-wrapped paddle-edge impressions on the rims. Occasionally a sherd occurred with elongate punctates at the shoulder, and a few have interior or exterior circular punctates around the neck.

After these pots were dry, they were fired at a low temperature, perhaps around a camp-fire. As has been stated previously, the vessels' main uses seem to have been for cooking, but a few may have served for storage (since parts of a number of vessels occurred in the bell-shaped storage pits at Lockport) and for carrying water.

Besides the vessel fragments, two small fired clay discs occurred in Level 1 of Cemetery Point. The function of these objects is unknown, though it has been suggested they were gaming discs.

The technique of chipping flint is the same as in the previous period. Though we found no flaker, the anvil stones on which the flint was worked did occur. Arrow points made from thin flakes are triangular, with or without side-notches. The side-notched ones are slightly different from the previous period in that the bases are convex, not straight, and the notches wide, not narrow. Larger triangular and tear-drop shaped points occur that may have been lance points. Fragments of large ovoid blades are fairly common, and a few crude roughly half-moon shaped ones occur. These could have been hafted as knives or daggers.

Tools connected with the working of hides are abundant. Flat flakes with retouching along one edge are the most numerous tools and probably had a number of uses. End-scrapers are mainly round or oval in outline and plano-convex in cross-section, but a few are triangular in outline, either plano-convex or flat on top. All of these were haftable, and rib fragments with one end rounded and the other slotted for the insertion of the end-scraper indicate the type of handle in use. Besides these stone-tipped fleshing tools, there is a fragment of deer leg-bone, bevelled to cutting edges, which, I believe, also was used as a scraping tool. At all the components of the Selkirk Focus there are fragments of flat stones, ovoid in outline, with rough percussion chipping along their edges. All are large (over 4 inches) in length and made from schist, sandstone, shale, or granite,

which do not allow for a sharp edge. These are very similar to blades hafted on long wooden handles for abrading or finishing skins now used by Athabascans along the Mackenzie River. Therefore, it has been concluded that people of the Selkirk Focus were using a similar tool for the same purpose.

Associated with these tools was a series of bone awls that could have been used for piercing leather. Some of these awls are made from split fragments of bone; a few are made from ulnas, but one is very long and made from the leg-bone of a deer. Also, there is one bone needle.

The decorations on the pottery reveal impressions of sinew and strands of raw hide, a material that may have been used for sewing the hides together. These impressions on the ceramics reveal not only that thongs of leather were made but that these were woven into nets and fabrics. Unfortunately, these impressions were made by paddling, and therefore are not clear. Often two sets of impressions overlap and are sometimes smudged. However, in spite of these difficulties fifty sherds that had clear impressions were found, and the following generalizations are based on these. Most of the sherds (41) show plain twine impressions; that is, there is a series of parallel warp elements that have two elements weft with one element passing below the warp and then above, and the other element passes above the warp and then crosses the first element and passes below the warp. A few (7) have a simple checker-board weave with a single weft element going above and below the warp, but the adjacent element does the opposite. Two sherds have a wrapped-twine weave; that is, a lattice of parallel warp and weft elements are woven together by a binding element that is wrapped around the crossing of the warp and weft. The final sherd seems to have the impressions of a simple coiled net; that is, one horizontal element has a series of loops that go around the next horizontal element having loops between the elements catching it, which in turn go around the next horizontal element, and so forth. Though I examined most of the other sherds carefully, I was unable to clearly discern other types of weaves, though a few looked as if they were twilled (over two, under two). How these various kinds of weave were used, other than in pottery-making, is difficult to say exactly. However, the weaving could have been used to make fish-nets, bags, and clothes.

Beaver teeth with abraded lingual surfaces may have been hafted to form crooked knives, and a celt made from antler may have been lashed at right angles to a handle. Both of these tools were probably used in wood-working.

The making of bone tools by cutting and polishing appears to have been an important activity. Bone tools include awls, barbed points, needles, scapula hoes or shovels, beaver teeth, celts, and fleshing tools. Flat slabs of slate or shale with ground edges may have been the sort of implement used to abrade the bone into shape.

Pebble hammerstones and full-grooved mauls occurred.

In many parts of the Selkirk Focus refuse there were charred fragments of birch-bark, though at Lockport in Pit 1 a fragment sewn together was found. Furthermore, one edge of this fragment appears to have some sort

of carved or bitten decoration. In Pit 1 there was a shell filled with red ochre. Thus the prehistoric Cree probably had painting and bark-carving, in addition to pottery decoration, as outlets for their artistic impulses.

Burial customs at present are known only from the single flexed burial at Lockport. The pottery and dog found with burial suggest some sort of burial ceremony and belief in the after life.

## CONCLUSIONS

The investigations in southeastern Manitoba have revealed a sequence of six cultures extending from before 3000 B.C. until about A.D. 1750. The first two cultures seem to have relationships into the Northern Great Plains. These two cultures in turn develop into the Anderson and Nutimik foci, which receive their Woodland pottery from the east. This would seem to cast serious doubt upon any hypothesis concerning the Asiatic origin of Woodland pottery that would have the spread of this pottery passing through southern Manitoba. The Manitoba Focus seems to be an invasion of the province of the same name by the Assiniboine. The fact that these people brought the first burial mounds into the area from the east indicates that Manitoba is not the route of diffusion of this possible Asiatic trait to the Eastern Woodlands. The final culture in Manitoba is the Selkirk Focus, which represents the early historic and prehistoric remains of the Cree. Thus it would seem that the Algonquin-speaking Cree are invaders into an area that was once occupied by Siouian-speaking peoples rather than the reverse. It also indicates that at least southern Manitoba was not the homeland of various Algonquin groups who spread out on the Great Plains.

As is perhaps obvious, our investigations in southern Manitoba are in no way complete, and considerably more research should be undertaken. However, we at least have an outline of the cultural sequence upon which future studies may be built.

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## ARCHÆOLOGICAL RECONNAISSANCE OF THE DELTA OF THE MACKENZIE RIVER AND YUKON COAST

*By Richard S. MacNeish*

An archæological reconnaissance was undertaken in the Mackenzie Delta and along the Yukon Arctic coastal plain in the summer of 1954 (See insert in Figure 1). This survey was a continuation of archæological endeavours in the Mackenzie River Drainage.<sup>1</sup> These previous undertakings had been, in part, to ascertain the kinds of archæological materials in the area as well as to find sites for excavation that would have some bearing upon the problem of early movements of peoples into the New World via the Mackenzie valley. One very important possible route of migration into the Mackenzie Drainage had not been covered in these reconnaissances and excavations. This hypothetical route was in the area, seemingly never covered by glaciers, that leads from the Yukon River of Alaska up the Old Crow River in the Yukon and down the Firth River to the coastal plain and the Mackenzie Delta. The activities in the 1954 season were concentrated on the northern end of this area with the hope that sites worthy of future excavation would be found.

The author left Ottawa early in June and arrived in Aklavik on the 20th of that month. Since break-up was late and the Yukon Arctic coast closed by ice, the first four weeks were spent in a brief survey in the Mackenzie Delta as far east as Point Atkinson. During this trip artifacts were collected from fifteen sites, and a house was excavated at Tuktoyaktuk. By July 25 the Arctic Ocean to the west had cleared, and with Alex and Frank Stefansson as guides I travelled westward by whale boat for six weeks.

Ten sites were found along the coast and on Herschel Island. Furthermore, five forays were made inland, one up the Blow River, one back to the mountains south of Ptarmigan Bay, one up the Malcom River, and two up the Firth. Five sites were found during these trips, of which one seems very important and should be excavated.

In the following pages are described the locations of the sites (Figure 1) and the kinds of material found without regard to cultural complex. As may be seen, much of this material is typical Thule Eskimo, but it seems worth describing since reports on the Mackenzie Delta Eskimo are few.<sup>2</sup> The other kinds of materials are even more important as they have never before been described for this region. In the final section, an attempt is made to present the sites and artifacts in terms of the sequence of complexes.

### THE SITES<sup>3</sup>

#### **NgTu 1**

This site is situated on a bluff at the southeasternmost corner of Richardson Island and called Tununuk Point by the local Eskimos. On

<sup>1</sup> MacNeish, 1951 and 1953.

<sup>2</sup> Mathiassen, 1930.

<sup>3</sup> Sites are numbered in the system devised by Charles E. Borden. See Borden, 1952.



the highest point there is a large series of graves, some of which are of fairly recent date. Just north of this bluff, around a small pothole lake, are some house remains that also seem recent.

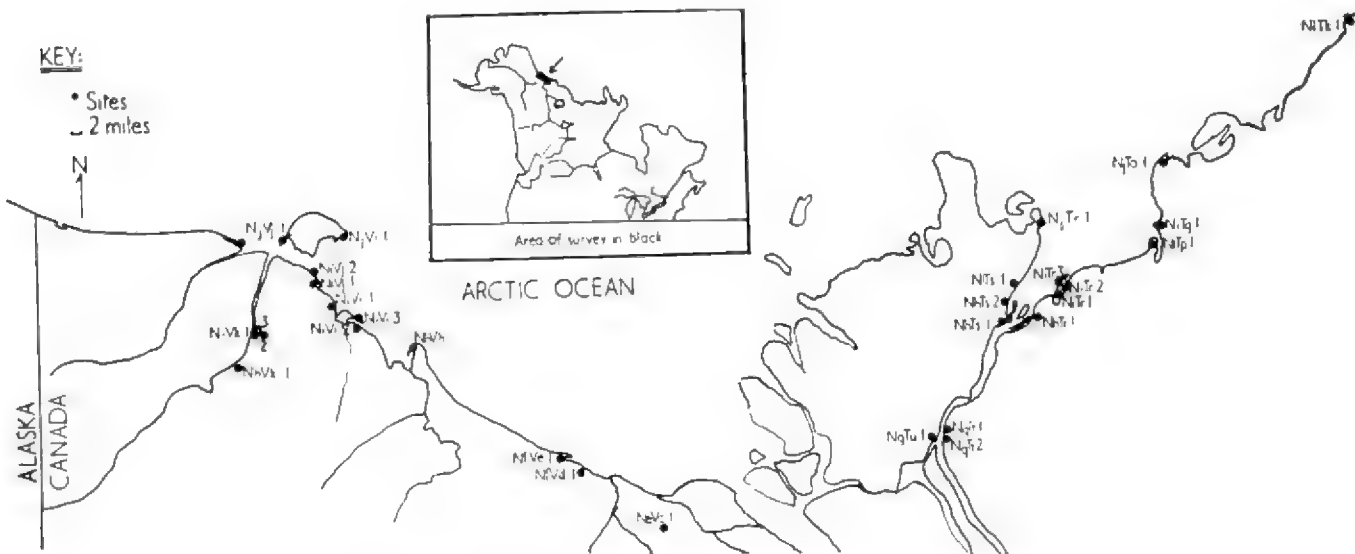


Figure 1. Map showing location of sites in the Mackenzie Delta-Yukon Coast region.

### NgTt 1

Across the west channel from Tununuk Point are the remains of a camp of the present-day reindeer herders. A few artifacts were found in the excavations around these houses.

### NiTr 1

This site is located on the sandspit directly south of Kittigazuit. The sandspit is between the ocean and the west channel leading to the east Whitefish Station. A few artifacts were picked up on the surface of this point; some graves are on the bluff above the point.

### NiTr 2

This is the well-known Kittigazuit. Most of the ancient site faces the bay that leads to the Whitefish Station, but the more recent buildings seem to be on the north side near where the west channel of the Mackenzie empties into the ocean. At the narrowest point of this peninsula, on the east side, a number of houses are being washed out of the bank. A large amount of material was collected from them as well as from the beach. Just back from the bank are the remains of two T-shaped houses, both of which appear to be late Thule (Figure 3, D1).

### NiTr 3

This site is about one hundred yards northwest of NiTr 2 and is located on the ocean side of Kittigazuit. The burned floor of a house was seen eroding out from the bank and was partially excavated. The artifacts, though typologically still Thule, seem somewhat earlier than those of the rest of the site.

**NiTp 1**

Much of the modern village of Tuktoyaktuk covers this site. A number of T-shaped houses are in the area of the boat house of the Catholic mission. More are directly south of the Hudson's Bay buildings along the shore of the inner bay. A few artifacts were picked up on the shore in front of both groups of houses, but most of them came from the excavation of House 1 in front of the modern cabin owned by Old Felix. A drawing may be seen of this house. It has a 12-foot-long entry-way, which had been covered by logs at right-angles to its axis. The main part of the house consisted of a central rectangular room about 12 feet long and 8 feet wide with three adjacent square rooms, 6 by 6 feet. Rising from the main chamber were four upright posts, which held a square roof frame. The three adjacent rooms were covered by logs radiating out from this frame, and the frame itself was covered by logs at right-angles to the main passage-way. This roof had been covered by sod, and the three adjacent rooms had split-log floors or beds (Figure 3, A-C).

**NjTo 1**

This site faces the Ocean at Toker Point. It is about twenty miles northeast of Tuktoyaktuk and consists of four T-shaped houses (Figure 3, D1). Dune sand covers most of it, and few artifacts were to be found. Iron nails in various roof beams indicate that it is quite recent.

**NiTs 1**

The site called Goopuk by the local inhabitants is directly across the channel from Kittigazuit on Richardson Island. Wave action is cutting into the bank and the point on which this site is located. The resulting cross-section revealed that the site is about three hundred yards long. The beach and the bank yielded a large number of Thule artifacts.

**NiTo 1**

The site is located north across the channel from Tuktoyaktuk along the Arctic Ocean. The depression of a large number of T-shaped houses may be seen (Figure 3, D1). Unfortunately dune sand and heavy grass covered the site, and few artifacts were collected.

**NhTs 1**

Across the channel from the radio station below Kittigazuit on Richardson Island is Lousy Point. Here the waves are cutting into the embankment, and though a few house remains could be seen, most of the artifacts came from the beach.

**NhTr 1**

The road leading from the dock to the radio station below Kittigazuit cuts through the site. Though bone was fairly abundant, the only artifacts found were potsherds.

**NhTs 2**

Between Goopuk and Lousy Point (Sites NiTs 1 and NhTs 1) is one prominent point on Richardson Island with a very high bluff. This is called Cache Point. The point is being eroded by wave action, and about three feet below the sod may be seen an ancient humus line. Artifacts were collected from this old living surface.

**NiTk 1**

This is the well-known site at Atkinson Point, about thirty-five miles northeast of Tuktoyaktuk. Because of weather conditions our stay at this site was very short, but the Museum has received a collection from this site and Mathiassen has described a collection of artifacts from this place.<sup>1</sup> In the description of artifacts, the data used are mainly from Mathiassen's report.

**NjTr 1**

The Museum has received a few artifacts from Kiklewait on the northeast end of Richardson Island. These are included in this report.

**NgTt 2**

On the mainland, just opposite the south end of Richardson Island, is a point called Nennorai. Though I visited this site during the survey, we found no artifacts, but the outlines of a number of T-shaped houses could be seen (Figure 3, D1).

However, the Museum did obtain artifacts in 1914 from this site, and these are included in this report.

**NeVc 1**

Directly inland from the west Whitefish Station, in the westernmost fringe of the Mackenzie Delta, we found the remains of an old Eskimo house. This site is at present about two miles from the ocean and at the edge of the mainland overlooking the flat swamp and islands of the delta. Seal bones in the refuse indicate that during its occupation it may very well have been next to the open sea. The outlines of a rectangular house with a long entry-way were apparent from the surface, and excavation of a small part of the back of the house yielded all the artifacts we found (Figure 3, D4). They appeared to be either early Thule or very late Birnirk.<sup>2</sup>

**NfVe 1**

On Shingle Point and the adjacent mainland there are abundant remains of fairly recent Eskimo houses and graves.

<sup>1</sup> Mathiassen, 1930.  
<sup>2</sup> Collins, 1940.

**NfVd 1**

This site is about three miles east of Shingle Point on the mainland just west of the delta of the Blow River. It seems to have been occupied in historic times and probably is the site visited by Osborne and party in 1939.<sup>1</sup>

**NiVi 1**

Site NiVi 1 is on a sandspit just west of Ptarmigan Bay. There were very few artifacts on this sandspit, and most of the occupation area seems to have been washed out by the waves.

**NiVj 1**

The bay just west of Ptarmigan Bay has a small knoll called Ekpekyok. On the west side of the small knoll were the remains of a few fairly recent houses, but we found practically no artifacts (Figure 3, D 5).

**NiVj 2**

This is the sandspit north of Ekpekyok. The remains of a few washed-out houses and animal bones indicated that this had once been a habitation area.

**NiVi 2**

On the west side of the bay directly east of Ptarmigan Bay the outlines of rectangular houses with very short entry-ways could be seen (Figure 3, D 5). Rusted iron, mingled with bone and fragments of slate, indicated that it was a recent site.

**NiVi 3**

Separating Ptarmigan Bay from the Arctic Ocean is a long sandspit on which site NiVi 2 is located. Eroding out of the dunes could be seen the remains of old houses, and a few artifacts occurred along the beach.

**NjVj 1**

One-quarter mile north of the southern tip of the sandspit at the southwest end of Herschel Island are the remains of a large number of modern Thule houses. As sand has drifted over much of the area, artifacts were difficult to find.

**NhVh 1**

Site NhVh 1 occurs at the very tip of Kay Point. Artifacts were present in the beach area and in graves on top of the knoll at the Point.

**NjVi 1**

On the Arctic shore, one-quarter mile north of the modern habitations of Herschel Island, the waves were eating into a series of houses. These six houses all had short entry-ways, a square main room, and a cupboard-like projection from one of the three walls (Figure 3, D 2).

<sup>1</sup> Osborne, D., 1952.

**NhVk 1**

Thirty miles up the Firth River from the Arctic Ocean on the north bank of the second large stream that enters the Firth River from the east, there is a low terrace on which the remains of three houses as well as artifacts were found. In outline, the houses are rather peculiar in that they have a small (10 feet in diameter), round main chamber and a 12-foot long entry-way (Figure 3, D 3). Excavation of part of one of these entry-ways revealed a large number of slate implements of Thule type. Food remains, however, were all of caribou and at sufficient depth to make one suspect that occupation had been fairly lengthy. This seems to be the remains of some sort of inland Eskimo group.

**NiVk 1**

Twenty miles up the Firth River, on the east bank, is a small erosional remnant in the broad river valley. This small mountain, about 1,000 feet long and 200 feet high, is called by the Eskimo "Engigteiak", or New Mountain. Between this remnant and the river-bank, the area is littered, for a distance of about a quarter of a mile, with chips and bone fragments. Excavation in a series of very small test pits uncovered a series of artifacts similar to the Cape Denbigh Flint Complex.

**NiVk 2**

Directly east of site NiVk 1 and against the northwest edge of the erosional remnant, we found a series of Thule Eskimo tools that seemed to represent a very much later occupation in this area.

**NiVk 3**

At the edge of the high terrace, about 400 yards north of site NiVk 1, separated from it by an area of about 300 yards in which there are no artifacts or bone, we found many flint chips as well as two pieces of pottery and a lamellar flake. This seems to represent still another occupation in this locale.

**THE ARTIFACTS****POTTERY**

**Thule Fibre-tempered Ware** (Plate I and Plate II, figure 4): Two hundred and fifty-seven fragments and one whole pot of this ware were uncovered.

**Paste:** The temper consists of large fragments (2 to 10 mm. in diameter) of crushed rock or small pebbles and grass or other fibrous material. The paste is very poorly knit and scales off easily. The pots appear to have been made by gradually adding flat pieces of clay to a small conical or flat bowl that formed the base. Firing was at a very low temperature, and colour ranges from black to mousy-grey or orangish-buff on the surface and is always black or brownish-black in the interiors. Hardness

ranges from 1 to 2, and the thickness of the sherds varies from 8 to 26 mm., with an average of about 18 mm. Surfaces are usually smooth and often show evidence of having been wiped by grass.

Decoration: Absent.

Vessel Form: As only 45 rim sherds and one whole pot were found, any conclusions concerning vessel forms are tentative. Rim sherds indicate that there are three general shapes. Those of the first group, represented by 31 rim sherds, have more or less vertical sides with a depression or groove just below the vertical rim, and flat lips (Figure 2, Nos. 1, 2, 3, 4, 7, 8). Probably these vertical sides blend into a conical bottom like that of the whole pot (Plate I). A second group, composed of seven specimens, has outflaring rims with either square or rounded lips, slightly constricted necks (Figure 2, Nos. 5 and 6) and globular bodies that perhaps blend into conical or sub-conoidal bottoms. The third group is composed of hemispherical bowls (Figure 2, No. 11). These may have served as lamps as well as cooking pots.

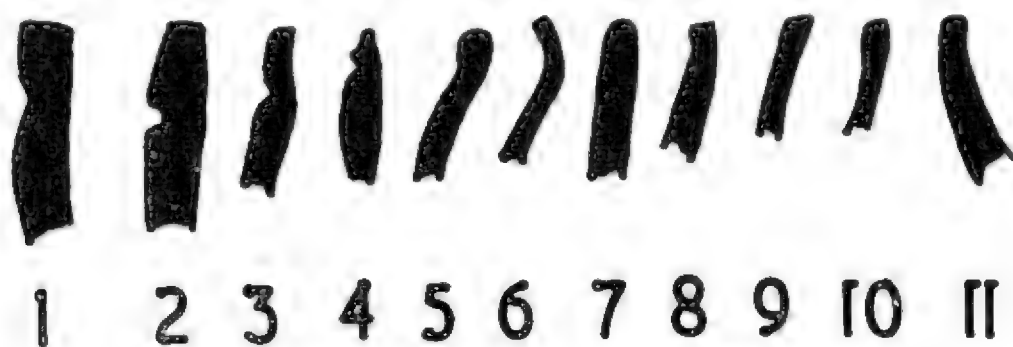


Figure 2. Rim profiles. Interior of vessels to the right.

Temporal and Geographical Range: This seems to be the typical Thule pottery that appears along the Arctic Coast from Bering Strait<sup>1</sup> to Repulse Bay.<sup>2</sup> As far as the Mackenzie Delta is concerned, it is late Thule and probably lasts until protohistoric times.

**Thule Grit-tempered Ware** (Plate II, figure 3): This ware is represented by twenty-six fragments, of which all but three come from two sites.

Paste: The temper consists of crushed rock from 1 to 4 mm. in diameter; no evidence of grass or fibrous temper is apparent. The consistency of the paste is poor (though not so poor as that of the Thule Fiber-tempered ware), and interiors are both porous and laminated. Firing was at a low temperature with the interior of sherds being black, but always with a lightening of colour to orange or grey at the exterior surface and sometimes at the interior surface as well. Hardness ranges from 1 to 3, and sherds vary in thickness from 8 to 17 mm., the average being about 10 mm.

<sup>1</sup> Collins, 1940, p. 567.

<sup>2</sup> Mathiassen, 1927, p. 66.



**Surfaces:** Surfaces were smoothed by wiping with grass.

**Vessel Form:** With this ware there seems to be mainly one vessel form (Figure 2, Nos. 5, 6, 8), which has a slightly outflaring rim, rounded or flat lips, and a globular body. No fragments of bases were found, but projection from large body fragments indicates that they were probably sub-conoidal.

**Temporal and Geographical Range:** This ware appears at five sites in the Yukon Coast-Mackenzie Delta area. There is some indication that at least one site is perhaps early Thule and another possibly transitional between Thule and late Birnirk.

**Mackenzie Complicated Stamp Ware** (Plate II, figure 1): Only two sherds of this ware were found.

**Paste:** The temper is crushed rock of small size (1 to 3 mm.) and appears in amounts large enough to give the sherds a sandy feel. The paste is poorly knit and laminated. Firing was not at a high temperature; interiors are black, but surfaces are orangish-brown or grey. Hardness of the two sherds is 2.5, and thickness is about 12 mm.

**Surfaces:** Surfaces were first smoothed by grass. Then the exteriors were beaten with a paddle bearing 3 to 4 concentric circles. The maximum diameter of the circles is 30 mm.

**Vessel Form:** Both rim sherds are insloping with slightly convex rims and lips (Figure 2, Nos. 9, 10). The one large rim fragment indicates that bodies were globular and possibly blended into a sub-conoidal base.

**Temporal and Geographical Range:** These two sherds represent the easternmost complicated stamp sherds in the Arctic, and temporally they seem to be either early Thule or proto-Thule.

**Firth River Ware** (Plate II, figure 2): Only two sherds of this ware occurred on site NiVk 3 on the Firth River.

**Paste:** The temper is grit about 2 mm. in diameter, and the paste is well knit though porous. Interiors are grey, and surfaces orange or orangish-grey. Hardness is slightly over 3, and sherds are about 6 mm. thick.

**Surface Finish:** Only one sherd shows the exterior surface, and its impressions are not clear. The impressions form parallel grooves, which are oblique to the main axis of the vessel. These impressions seem to have been made either by a grooved or cord-wrapped paddle.

**Vessel Forms:** The one rim sherd is slightly excurvate and insloping with a flat lip.

**Temporal and Geographical Range:** I know of no similar sherd in the area, and their close association with a lamellar flake and their nearness to site NiVk 1 with its burins make me suspect that these sherds are earlier than the others in this area.

**Steatite Vessels:** Eleven fragments of steatite vessels occurred. Four are rim fragments of bowls, and one is the flat base of a bathtub-shaped vessel. Most of these are probably fragments of lamps. There are also five wall fragments showing neither base nor rim. The final fragment is of a large vertical-sided jar with a horizontal lug near its lip and drilled holes at the base for attachment.

#### CHIPPED STONE

**Lance Points** (Plate III, figures 6, 7): Five whole and nine basal fragments of lance points were found in the survey. All are long (from 58 to 156 mm.) and narrow (22 to 32 mm.), with short, wide (15 to 41 mm.) stems (15 to 25 mm.), with rounded or pointed bases. There also occurred five point or blade fragments of large points at Engigtciak (NiVk 1).

**Arrow Points** (Plate III, figure 5): The arrow points are the same shape as the lance points but smaller in size, with length ranging from 38 to 54 mm., and maximum width just above the stem, about 15 mm.

**Aberrant Point** (Plate III, figure 10): This one point came from the east side of Kittigazuit and is roughly triangular in outline, 25 mm. long and 25 mm. wide, with a very short bifurcated stem.

**Tear-drop shaped Objects** (Plate III, figure 9): These three points are roughly tear-drop in shape and bifacially chipped. They range from 33 to 53 mm. in length and from 25 to 38 mm. in width. They may have served a variety of uses, such as knife blades, projectile points, and possibly even end-scrapers.

**Bifacial Blades** (Plate III, figures 1-3): These artifacts are difficult to classify and probably had a variety of functions. Small ones (25 by 33 mm.) are roundish; the larger ones are ovoid (79 by 141 mm.)

**Laurel-leaf shaped Bladelettes** (Plate IV, figures 1, 2): Three bladelettes occurred at Engigtciak. Two are almost complete; the third is a pointed end. The two complete ones are roughly 30 mm. long, 13 mm. wide, and 2 mm. thick. They are pointed at both ends, have convex edges, and are laurel-leaf in outline. One has delicate ripple flaking on it; the fragment and the larger one have crude collateral flaking. In every respect they are similar to ones at Cape Denbigh<sup>1</sup> and at Sarqaq.<sup>2</sup>

**Chipped Slate:** A number of fragments of slate with chipped edges occurred in a variety of shapes. I believe most of these represent incomplete artifacts.

**Chipped Plates:** These are large (120 to 222 mm. maximum width), flat pieces of slate or sandstone that have had their edges chipped bifacially to form square or ovoid plates. All have a thick encrustation of grease on one surface.

<sup>1</sup> Giddings, 1951.

<sup>2</sup> Meldgaard, 1952.

**Netsinkers:** Three flat pebbles (about 100 mm. in diameter) have notches on opposite sides for tying to a net.

**Flake Side-scrappers** (Plate IV, figure 7): At a number of sites there were irregularly-shaped flakes of flint, flat on one side, and pressure flaking near one edge on the opposite side. Three rather thick ones contrast with four found at Engigtciaik that were very thin with very short, steep retouching.

**Small Triangular End-scrappers** (Plate IV, figure 5): Five triangular end-scrappers were found. They range from 18 to 36 mm. wide and from 20 to 37 mm. long. All are ventrally flat and dorsally convex, and their steep retouched cutting edges make them snub-nosed. Four of these, which are all near the small end of the range, came from Engigtciaik and are similar in size and shape to the dominant type at Cape Denbigh.<sup>1</sup>

**Lamellar Flakes:** One small fragment of a lamellar flake occurred with the early impressed pottery near Engigtciaik, and one occurred at the site at the edge of the Mackenzie Delta (NeVc 1) in the Yukon (Plate IV, figure 9). Two fragments of lamellar flakes occurred at Engigtciaik, and both have been made into other artifacts: one is an end-of-the-blade scraper and the other is a side blade with ripple flaking across its dorsal surface (Plate IV, figure 6).

**Drill** (Plate III, figure 8): One biface blade, 40 mm. long and 32 mm. wide, has a 14 mm. long chipped projection on one end, about 5 mm. wide, that could have been used as a drill point.

**Angle Burins** (Plate IV, figures 3, 4): Three angle burins occurred at Engigtciaik. All are small (18 to 25 mm. long, 10 mm. wide, and from 2 to 6 mm. thick) and one edge has been obliquely trimmed, making it roughly triangular. Retouching is present on the surface of one of them (Plate IV, figure 3), and retouching is always on the edge opposite the oblique trimming. In addition, one has retouching at the basal edge; the other two, however, are retouched on the top edge adjacent to the trimming (Plate IV, figure 4). As most of this retouching along the edge is bifacial and very short, it seems to have been made rather to blunt the edges than to sharpen them. This type of burin is characteristic of the Sarqaaq sites in the eastern Arctic<sup>2</sup> and the Cape Denbigh sites in Alaska.<sup>3</sup>

#### GROUND STONE

**Ulus:** Seventy-seven fragments of ulus occurred. Fifty-one are fragments of the cutting edge, and six are unfinished. Two are roughly pie-shaped (Plate III, figure 26), being 51 to 106 mm. wide and 28 to 72 mm. long. Eighteen specimens have a wide straight stem and

<sup>1</sup> Giddings, 1951.

<sup>2</sup> Meldgaard, 1952.

<sup>3</sup> Giddings, 1951; Collins, 1953.

semi-lunar cutting edge (Plate III, figure 27). The latter specimens have a cutting edge of 68 to 153 mm. wide, are 41 to 122 mm. long, and have stems 32 to 112 mm. wide and 15 to 46 mm. long.

**Men's Knife Blade:** Eighteen point fragments and two incomplete blanks of men's slate knives were found, along with four fragments having the stem ground on one side (Plate III, figure 24) and twelve with the stem ground on both sides (Plate III, figure 25). Measurements range from 121 mm. long and 90 mm. wide, with a stem 50 mm. long and 45 mm. wide, to one 95 mm. long and 25 mm. wide, with a stem 15 mm. long and 31 mm. wide.

**Slate Harpoon Blades:** Six ground slate harpoon blades were recovered. All are short (38 to 46 mm.) in proportion to their width (24 to 31 mm.) and roughly triangular in outline. All have slightly convex tapering edges, though two have a very slightly convex base (Plate III, figure 19), and four have concave bases (Plate III, figure 18).

**Slate Lance Point** (Plate III, figures 20, 21): Two contracting stemmed slate lance points occurred. Both are diamond-shaped in cross-section. They are 65 and 75 mm. long, 14 and 21 mm. wide, with stems 11 and 14 mm. wide and 17 and 10 mm. long.

**Slate Chisel or End-scraper** (Plate III, figure 22): One chisel-like object of slate with a length of 55 mm. and a maximum width of 32 mm. was found. It has a chipped stem 30 mm. long and about 22 mm. wide.

**Adze Heads:** Two adze heads were found. One is of slate and is small and flat, being 82 mm. long, 50 mm. wide, and 11 mm. thick (Plate III, figure 11); the other is long and narrow, being 170 mm. long, 35 mm. wide, and 31 mm. thick (Plate III, figure 23).

**Abrading Stone:** One rectangular piece of sandstone shows abrading on one side, and an elongate pebble chisel-like wear on one end (Plate III, figure 14).

**Arrow Smoother:** One flat piece of sandstone has a rounded groove, about 12 mm. wide and deep, crossing it (Plate III, figure 12).

**Bolo Weight** (Plate III, figure 13): One round (35 mm. diameter) sandstone pebble has a deep groove cut into one side, which leaves a button-like projection (15 mm. in diameter and 5 mm. high).

**Grooved Pebbles:** One elongated flat pebble has a single groove around one end (Plate III, figure 15); another has four grooves around one end (Plate III, figure 17). Both have a single line at right angles to grooves running parallel to the sides of the pebble. A third pebble of hematite has three grooves crossing one surface, and on the opposite surface has a deep wide groove (Plate III, figure 16). All are quite small, being about 20 mm. wide and 60 mm. long. These may have been parts of fish-lure weights.

## BONE TOOLS

**Whale-rib Sled Shoes:** Eighteen fragments of sled runners made from whale rib-bones were recovered from nine sites. All have drilled holes for bone plugs or nails.

**Ice Picks:** A number of whale ribs have oblique polished points and may have been used as ice picks (Plate VI, figure 7).

**Blunt Arrow Points:** Five were found, and each is slightly different. Two have bifurcated bases, but the larger of these (65 mm.) is plain with a round end (Plate V, figure 11); the other (55 mm.) has an end shaped like a four-leaf clover as well as a series of incised lines encircling its central shaft (Plate V, figure 10). Another (75 mm. long) has a pointed base and an end shaped like a three-leaf clover as well as two sets of two incised lines around its central part (Plate V, figure 9). There are also two with a pointed base and a plain blunt end (53 mm. long). The fifth, a hollow bone with expanded end, has eight "V"-shaped notches cut into it (Plate V, figure 12).

**Arrow Points:** Many broken and whole arrowheads in a variety of forms were picked up. All have short (10 to 40 mm. in length) conical bases slightly smaller in diameter than the main part of the shaft. Two of the bases show small spurs for gripping the main shaft. Two are without barbs (about 135 mm. long); one is narrow (8 mm. wide), and the other is wide and flat (16 mm. wide) with a single medial incised line on both sides (Plate V, figure 7). Three flat wide ones (9 to 14 mm. wide) have a single barb and range from 58 to 163 mm. long. (Plate V, figure 5). Two have two barbs on one side and are 153 and 218 mm. long and 15 mm. wide (Plate V, figure 4). Four have three unilateral barbs and range from 135 to 215 mm. in length and are 10 mm. wide (Plate V, figure 3). The bodies of two of these are triangular in cross-section; the other two are ovoid. Two have a single barb and an end slot for an arrow point (Plate V, figure 6). There is also one with a single barb on either side (Plate V, figure 1), and one with four bilateral barbs (Plate V, figure 2).

**Harpoon Foreshaft Holders:** Two harpoon foreshaft holders (about 200 mm. long) occurred. One end of these is hollow and the other is wedge-shaped and scored.

**Harpoon Foreshafts:** Two harpoon foreshafts have two conical ends and are triangular in cross-section. The centre of the shafts have been pierced. They are 160 and 179 mm. long and have maximum widths of 20 mm.

**Thule Type I Harpoon:**<sup>1</sup> One thin long harpoon (108 mm. long by 20 mm. wide) has a gouged line hole from side to side, one dorsal spur, an open shaft socket, and a slit for the lashing on either side of the

<sup>1</sup> Mathiassen, 1927, p. 24.

line hole. In all respects except the gouged line hole, this is a typical Thule harpoon (Plate V, figure 21). However, the gouged line hole resembles those in Dorset, though other features of the harpoon do not.

**Thule Type II Harpoon:** <sup>1</sup> This long harpoon (208 mm.) has a triangular line hole from side to side, one dorsal spur, an open shaft socket, and a slot for lashings around the open shaft socket (Plate V, figure 22). It is extremely large for a Thule type and is similar to some found with the late Birnik and Punuk remains.<sup>2</sup>

**Thule Type III Harpoon:** <sup>3</sup> Two fragments of harpoons have line holes from side to side, one dorsal spur, an open shaft socket, grooves for lashing, and a slot for a blade set parallel to the line hole (Plate V, figure 20).

**Thule Type IVa Harpoon:** <sup>4</sup> Two small harpoons (about 70 mm. long and 15 mm. maximum width) were found. They have a line hole from side to side, a single spur, a closed shaft socket, and a blade slot parallel to the line hole (Plate V, figure 19).

**Thule Type IV Harpoon:** <sup>5</sup> There is one large whaling harpoon 200 mm. long with a line hole from side to side, a single spur, a closed shaft socket, and a blade slot at right angles to the line hole (Plate V, figure 23).

**Lashable Object:** At Engigtciaik one bone artifact was dug from the lowest level of the laminated refuse about two feet below the surface (along with one angle burin). This object is roughly rectangular in outline, about 140 mm. long and 35 mm. wide. One end is bevelled and slightly rounded; the other is square and flat. Between the flat and bevelled ends, the central part has been squared off and a series of narrow, closely-spaced, incised lines encircle the two at right angles to the main axis. These grooves look as if made to grip some sort of lashing or cordage. However, the exact function of this bone object is unknown.

**Leister Prongs:** The leister prongs range from 95 to 168 mm. in length, and all are narrow and pointed at both ends. Two have three barbs on one side (Plate V, figures 13, 14), one has four (Plate V, figure 15), one has five (Plate V, figure 16), and one has a single barb on both sides (Plate V, figure 17).

**Men's Knife Handles** (Plate V, figure 18): There are four rectangular fragments of men's knives with holes for holding the blades as well as two T-shaped knife handles. One is 95 mm. long and 25 mm. wide, and the other is 135 mm. long and 30 mm. wide.

<sup>1</sup> Mathiassen, 1927, p. 24.

<sup>2</sup> Collins, 1933.

<sup>3</sup> Mathiassen, 1927, p. 25.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.



**Women's Knife Handles:** Two ulu handles are rectangular in cross-section and outline (being 37 and 50 mm. long and 23 mm. wide) with small (25 mm. long) rectangular slots in them for the blades. The other is semi-lunar in outline (105 mm. long and 25 mm. wide) with a long groove for the insertion of the ulu blade.

**Whip Handle** (Plate VI, figure 9): One very long (252 mm.) T-shaped object was identified by my Eskimo companions as being a whip handle.

**Men's Knife or Scraper Handles:** All the scraper handles are roughly rectangular in outline (110 to 190 mm. long and 18 to 25 mm. wide) except for one that is T-shaped (Plate V, figure 29). All have a rectangular slot for the scraper in one end with four holes in the opposite end for carrying them. It is perhaps of significance that the one from NeVc 1 has a gouged hole rather than a drilled one (Plate V, figure 30).

**Side Blade Knives:** Two fragments of ribs have slots for side blades.

**Bow Drill:** One fragment of a whale rib had been cut into a bow (735 mm. long) for drilling and had two drilled holes at its extremities.

**Mattock Heads** (Plate VI, figure 10): There are three large fragments of mattock heads made from the ribs of whales. All are bevelled at one end and rounded at the other with three large notches near the rounded end for lashing the head to a handle. The largest one is 395 mm. long, 98 mm. wide, and about 33 mm. thick; the smallest is 250 mm. long, 48 mm. wide, and 42 mm. thick.

**Adze Sockets** (Plate VI, figure 5): Three fragments appear to be incomplete adze sockets: they are large bone fragments with one end hollowed out for an adze head, but they have no area prepared for lashing the hand socket to a handle. Two more are completed ones that have been broken. The complete one is rectangular in outline, 114 mm. long, 58 mm. wide, and about 20 mm. thick. One end is rounded, and the other end bears a hollowed part for the insertion of an adze head. Near the opposite end from the socket are two parallel lines of holes with a flattened area for the attachment of a handle.

**Adze Handle** (Plate VI, figure 11): One bone handle occurred. It is made from a long, curved, caribou bone (about 270 mm. long and 20 mm. wide). One end is flared and flattened with two holes for thongs to attach the socket; the other end bears a single hole for carrying.

**Wedges** (Plate V, figure 28): There are four bone wedges, ranging from 85 to 173 mm. long and from 22 to 55 mm. wide. They are made of rib bones that are flattened on one end and bevelled from two surfaces on the other.

**Thong Stretchers or Arrow Straighteners** (Plate VI, figures 3, 4): There are two arrow straighteners or thong stretchers (151 and 175 mm. long). Both have one end squared and the other end, containing a triangular hole, expanded. One of these expanded ends is roughly triangular; the other is rounded.

**Snow Shovel Blade** (Plate VI, figure 1): One fragment of a pear-shaped shovel blade occurred. A reconstruction of it reveals that it was about 250 mm. long and had a maximum width of 160 mm. In the narrow part are two parallel lines of three holes for lashing the handle to the blade. There are also two holes in the blade, perhaps for reinforcement or for repair of a crack.

**Snow-Knife** (Plate VI, figure 6): A concentric-shaped snow-knife (about 240 mm. long) has a rectangular handle and a half-moon shaped blade. The end of the handle is pierced and has a nub projecting toward the concave edge of the knife.

**Bone Beamer** (Plate VI, figure 8): A longitudinally split caribou leg-bone, 272 mm. long and about 30 mm. wide, might have been used for beaming on its split surface. The opposite surface has an engraving of three caribous.

**Bone Flaking Tools:** Four bone flaking tools, ranging from 62 mm. to 89 mm. in length, and being about 10 mm. in diameter, show blunting and working on one end; their opposite ends have been smoothed.

**Bone Awls:** Ten pieces of split bone that have been worked to a point and then polished may have been used as bone awls.

**Bone Tubes:** Nine bird leg-bones have been cut to make tubes. They range in length from one that is 36 mm. long to one that is 185 mm. long, and in diameter from 6 to 21 mm. Some of the ones of larger diameter may have been sucking tubes (Plate V, No. 31), and the smaller ones some sort of bone beads (Plate V, figure 32).

**Lip Plugs:** There are four lip plugs. Two are of stone and are shaped like a cuff-button with a rounded knob and a rectangular base (Plate V, figure 24). A third one, of bone, has a similar base but a rectangular knob (Plate V, figure 25). A fourth is of stone and has a long, ovoid, concave base with a slight depression between the two parts (Plate V, figure 26).

**Net Spacers** (Plate VI, figure 2): Five net spacers are made out of bone and are about 150 mm. long, with a maximum width of about 25 mm. All have one convex end with the other end concave, and on one side is a barb about 50 mm. long. Two of them have drilled holes near the base.

**Rectangular Net Spacers:** There are two small, flat, rectangular net spacers about 30 by 20 mm.

- Wound Plugs** (Plate V, figures 34, 35): Three flat bone plugs, ranging from 70 to 113 mm. in length, and from 8 to 13 mm. in maximum width, have polished conical points and a flat button-like top. I believe these were used as wound plugs.
- Needle-Case Box Tops** (Plate V, figure 27): There are two flat rectangular needle-case box tops, one being 80 mm. in length and the other 68 mm., and each is about 35 mm. in width. Both have two holes in the middle of the longer side, and the one with a central hole has a chevron inside the design.
- Scapula Scrapers:** Two fragments of seal scapulas have their thinner edges polished for cutting or scraping.
- Bone Spoon** (Plate V, figure 33): One fragment of a caribou scapula has been cut into the shape of a spoon. It is 125 mm. long, and the bulbous end is 45 mm. wide.
- Bone Comb** (Plate V, figure 36): One fragment of a bone comb, with a rectangular base 40 by 50 mm. and teeth 30 mm. long, was found.
- Bone Fish-hook** (Plate V, figure 37): One bone fish-hook, 120 mm. long, is in the shape of a minnow, having a small ground hole in the minnow's tail for the line and a larger hole in its head for an oblique bar. There is also a shorter fish-hook in the shape of an isosceles triangle, 65 mm. long, with similarly drilled holes.
- Bone Bow Tightener:** Two bow tighteners occurred. They are 78 and 109 mm. in length and about 12 mm. wide and 7 mm. thick. Both have ends slightly bent in opposite directions.
- Bone Snow Goggle Visor** (Plate V, figure 38): There is a crescentic visor 120 mm. long with a maximum width of 36 mm. The concave side has seven holes drilled in it for attaching it to the goggles. Also, at site NiV<sub>k</sub> 2 on the Yukon coast, there was found a small triangular piece of bone with a slit in it that may be part of a snow goggle.
- Handles for Sled:** Two bone handles for the back upright of a sled are roughly crescentic and 160 and 210 mm. long. They both have three holes near one tip of the crescent and a single hole at the other tip.
- Bone Plug:** Three bone plugs are about 25 to 30 mm. long and 10 mm. in diameter. One end is flattened and the other is rounded.

## HOUSES

### T-shaped House (Fig. 3, A-C)

At most of the sites in the Mackenzie Delta and to the east of it, T-shaped houses were found. These T-shaped houses have entry-ways from 10 to 20 feet long. The ones with shorter entry-ways seem to be a little more recent than the others. The entry-way leading to a large



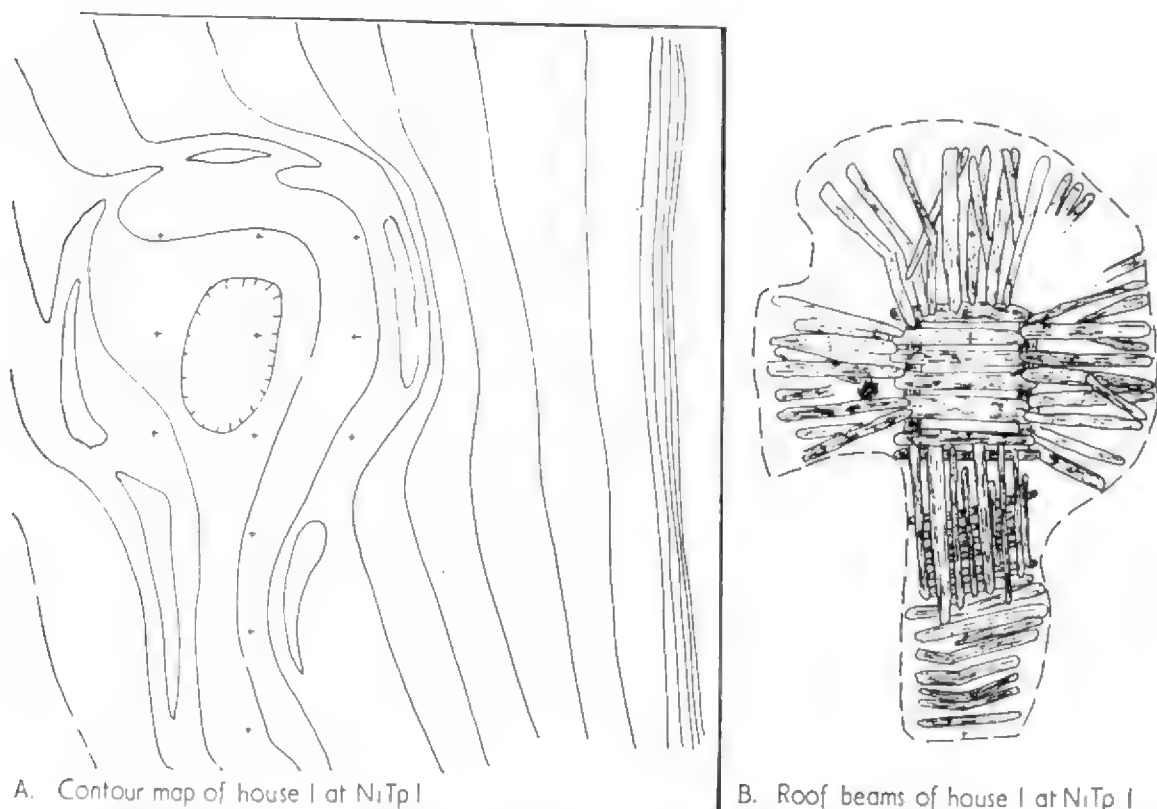


**Table I. Correlation of Traits and Sites—*Conc.***

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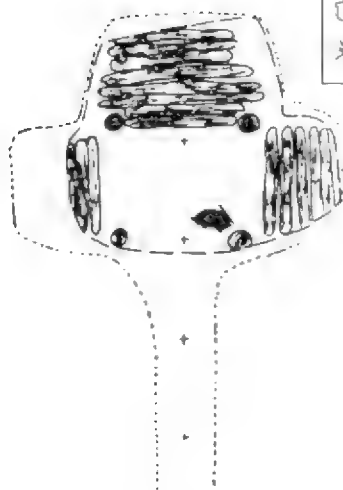


rectangular room has two side chambers opposite each other near the front of the house; thus the house gives the appearance of having three side rooms. One house of this variety was excavated at Tuktoyaktuk. This house has split beams covering the floors of the three side rooms and four upright posts in the main room. These four upright posts support

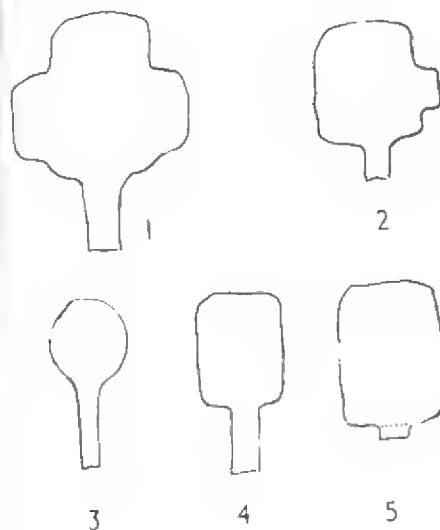


KEY for A,B and C:

- edge of 1954 excavation
- edge of ancient excavation
- 6 inch contour interval
- 4 feet distance
- logs
- burned area



C. Floor plan of house 1 at NiTp 1



D. Outlines of house types

Figure 3. A. Contour map of house 1 at NiTp 1.  
B. Roof beams of house 1 at NiTp 1.  
C. Floor plan of house 1 at NiTp 1.  
D. Outlines of house types.

the square frame, and logs were laid on this frame to form the roof of the main chamber, and the other logs radiated out from it to form roofs for the side chambers.

### **Herschel Island-type House** (Fig. 3, D2)

Houses of this variety were found only on Herschel Island. They have a short entry-way from 3 to 7 feet long, with a square main chamber from 10 to 15 feet wide. There is always a small cupboard-like projection extending out from one of the three walls.

### **Modern Thule House** (Fig. 3, D5)

Modern Thule houses occurred in a number of sites and were only briefly studied.<sup>1</sup> These houses usually have a very short entry-way, or no entry-way at all. The main chamber is rectangular and is not very deeply sunken into the ground.

### **Early Thule House** (Fig. 3, D4)

No houses of this variety were dug, but the outlines of three could be seen at NeVc 1. All of these have long entry-ways of about 15 feet or more, and rectangular main chambers about 15 feet wide and 20 feet long. These appear to be an earlier type of house in the Mackenzie Delta area.

### **Inland House** (Fig. 3, D3)

The outlines of three houses were seen at NhVk 1. These houses had circular main chambers about 10 feet in diameter and long entry-ways, from about 10 to 15 feet. Since they are in a treeless area and since a little soil-stripping in one of them revealed only burned twigs, about 2 inches in diameter, I suspect that they were roofed with skins stretched over a stick frame. Whether these houses are a special trait of some sort of inland Eskimo or merely summer houses of the coastal Eskimos is unknown.

## **CONCLUSIONS**

As may be seen from the accompanying Table I, there appear to be at least three major cultural complexes represented in the Yukon Coast-Mackenzie Delta area. With practically no excavation, the best that can be done in terms of chronology is to classify them tentatively on the basis of seriation and of comparisons with Alaska, where there is adequate stratigraphic data.

The very specialized traits, such as angle burins, bladelettes with ripple flaking, end-of-the-blade scrapers, lamellar flakes, and small triangular snub-nose end-scrapers, as well as the more general items such as the fragments of lance blades and side-scrapers, which were recovered at Engigteiak (NiVk 1) on the Firth River, allow this site to be tentatively classified as a component of the Cape Denbigh (Flint Complex or) Phase.<sup>2</sup>

<sup>1</sup> See Osborne, 1952.

<sup>2</sup> Giddings, 1951.

These same traits indicate that it is somehow related to the Sarqaq Phase of Greenland<sup>1</sup> and the eastern Arctic, as well as the Neolithic or Mesolithic of eastern Siberia.<sup>2</sup> Since Cape Denbigh is the earliest culture so far found in Alaska, it is not unreasonable to consider that the Engigtciak site, with a similar complex, is the earliest of the sites located on this survey of the Yukon arctic coast. Exactly when the Cape Denbigh phase appeared on the Firth River is difficult to determine as the Cape Denbigh phase of Alaska has been assigned five distinct dates: older than 8,000 or 12,000 years on the basis of the geology of Iyatayet site,<sup>3</sup> 5,900 years ago from Carbon 14 determination of the Denbigh Level of Trail Creek Cave, and 4,658 and 3,509 years ago from Carbon 14 determination from the Cape Denbigh site itself, and, finally, Giddings and Hopkins believe it to have existed from 5,000 to 9,000 years ago.<sup>4</sup>

The second earliest materials seem to be the lamellar flake and the two impressed sherds from site YC-15. This site is most poorly represented, but its three artifacts hint at some sort of separate complex. Comparable materials are as yet unknown, but the presence of a lamellar flake like those of Engigtciak suggests it is early, but the pottery would seem to show that it is more recent than the Cape Denbigh-like site.

The third large complex seems to be Thule Eskimo. Many of the sites had very few artifacts, and some of them are undoubtedly very recent; but six (NiTr 2, NiTp 1, NiTs 1, NhTs 1, NiTk 1, as well as NjVi 1) seem to be typical late prehistoric or proto-historic Mackenzie Delta Thule. A minor variation within this complex is to be found in sites on Herschel Island where the houses are not cross-shaped but have short entrance passages and a single chamber adjoining the main room. Another variant of Thule seems to be somewhat earlier and is represented at NeVc 1, NiTr 3, and NhTs 2. My basis for considering these sites somewhat earlier is the fact that food (bone) materials show them to have been sea-hunting people and therefore probably living on the shores of the ocean. But neither NeVc 1 or NhTs 2 are now on the ocean like most of the later Thule sites. Therefore, it would seem they were occupied at an earlier date when the ocean level was higher. The grit-tempered and complicated stamp pottery seems to be a good time-marker of this earlier Thule, and it is possible that the large Type 2 harpoon, the lamellar flake, and the rectangular house with a long entrance found at the site inland from the west Whitefish Station (NeVc 1) are also characteristics of this period. This hint of Thule chronology should be much more fully investigated. The third possible variant of Thule is represented by the inland sites along the Firth River (NhVc 1 and NiVc 2). Whether these remains are an actual separate inland Thule Eskimo complex, or merely seasonal inland sites of coastal people, cannot be ascertained from the present data. However, local traditions indicate there was a separate inland people in this area, and the problem is worthy of further investigation.

In conclusion, the survey of the Yukon Coast and the Mackenzie Delta has added to our scant knowledge of the kinds of archæological

<sup>1</sup> Meldgaard, 1952.

<sup>2</sup> Collins, 1954.

<sup>3</sup> Hopkins and Giddings, 1953.

<sup>4</sup> Giddings, 1955.

materials in that area. The most important of these materials, which correspond to the Cape Denbigh Flint Complex remains, are from Engigteiak along the Firth River. It is likely that Engigteiak can contribute greatly to the solution of problems concerning this burin-making culture known from Alaska.<sup>1</sup> First of all, the previously excavated Cape Denbigh sites have not had well-preserved bone, but this new Firth River site gives every indication that excavation should yield a number of bone tools. Since there is the possibility that Cape Denbigh may be in some way ancestral to early Eskimo and Dorset, complexes in which bone tools are particularly diagnostic, a knowledge of Cape Denbigh bone tools may be very necessary for fully comprehending these relationships. Also, the location of Engigteiak between the Alaskan Cape Denbigh sites and the related Sarqaaq sites in the eastern Arctic, and the fact that Engigteiak is next to the Mackenzie River, down which may have passed the ancestors of the early men whose remains have been uncovered in the United States, place it in a strategic position both for the understanding of these early East-West Arctic relationships, and possibly for shedding light on the routes of movements of early Americans from north to south. Finally, new and fuller materials from a site bearing the Cape Denbigh complex may yield a clearer picture than we have so far had of the age of that complex. Thus future excavations in the Mackenzie Delta and Yukon-Arctic coast are fraught with possibilities.

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<sup>1</sup> MacNeish, 1954.

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PLATE I

( $\frac{1}{2}$  natural size)

(National Museum of Canada Neg. No. 3299)

Whole pot of Thule Fiber-tempered Ware, excavated in a trash heap south of  
House 1 at NiTp 1.  
(Cat. No. IX-D-530.)



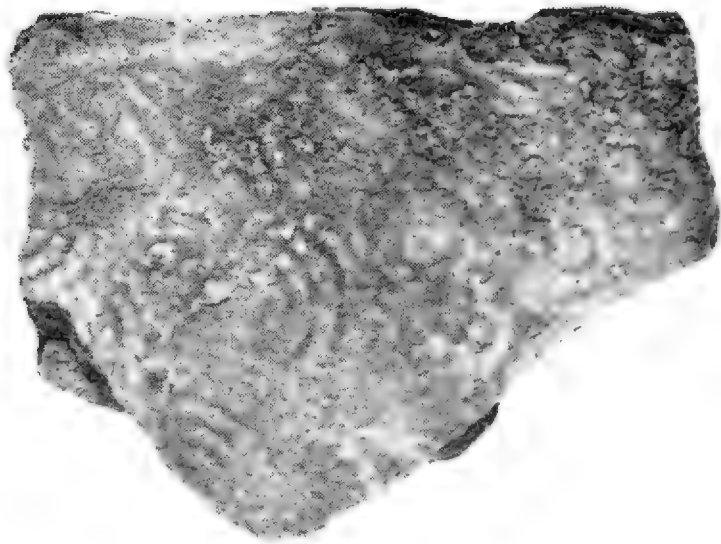


## PLATE II

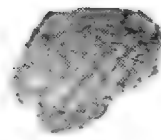
 $(\frac{1}{2}$  natural size)

(National Museum of Canada Neg. No. J 3295)

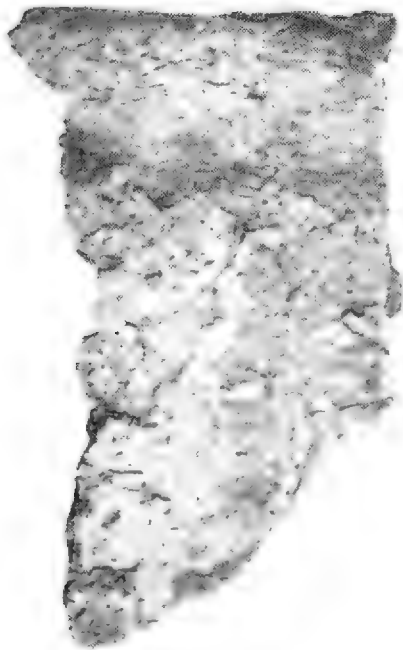
- Figure 1. Mackenzie Complicated Stamp Ware (Cat. No. IX-D-515).  
Figure 2. Firth River Ware (Cat. No. IX-E-66b).  
Figure 3. Thule Grit-tempered Ware (Cat. No. IX-D-473).  
Figure 4. Thule Fiber-tempered Ware (Cat. No. IX-D-567).



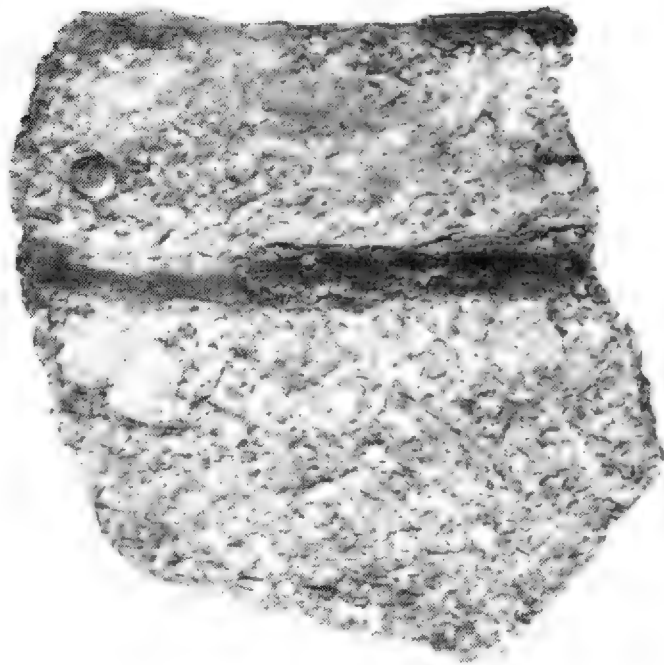
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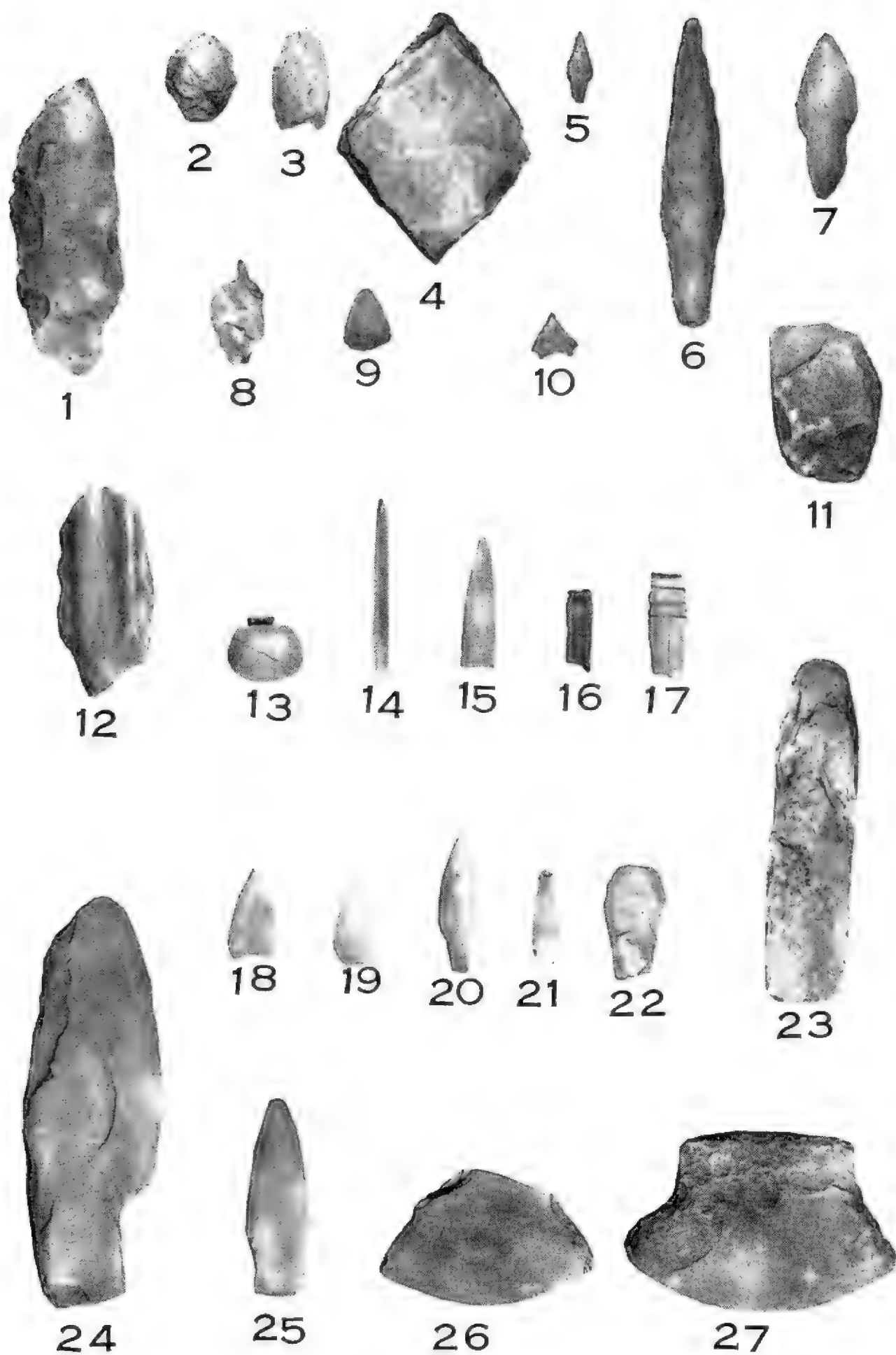
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## PLATE III

(1/4 natural size)

(National Museum of Canada Neg. No. J 3291)

- Figure 1. Large flint bifacial blade (Cat. No. IX-D-430).
- Figure 2. Small flint bifacial blade (Cat. No. IX-D-535).
- Figure 3. Small flint bifacial blade (Cat. No. IX-D-432).
- Figure 4. Chipped slate bifacial blade (Cat. No. IX-E-42c).
- Figure 5. Chipped arrow point (Cat. No. IX-E-72).
- Figure 6. Chipped lance point (Cat. No. IX-D-534).
- Figure 7. Chipped lance point (Cat. No. IX-D-568).
- Figure 8. Chipped drill (Cat. No. IX-E-53).
- Figure 9. Chipped tear-drop shaped object (Cat. No. IX-D-491).
- Figure 10. Chipped arrow point (Cat. No. IX-D-511).
- Figure 11. Flat adze head (Cat. No. IX-D-498).
- Figure 12. Ground stone arrow-straightener (Cat. No. IX-D-509).
- Figure 13. Bolo stone (Cat. No. IX-D-546).
- Figure 14. Chisel-like abrader (Cat. No. IX-E-5).
- Figure 15. Grooved pebble line sinker (Cat. No. IX-D-454).
- Figure 16. Grooved pebble line sinker (Cat. No. IX-D-605).
- Figure 17. Grooved pebble line sinker (Cat. No. IX-D-452).
- Figure 18. Ground slate harpoon blade with concave base (Cat. No. IX-D-140).
- Figure 19. Ground slate harpoon blade with convex base (Cat. No. IX-D-434).
- Figure 20. Ground slate lance head (Cat. No. IX-D-606).
- Figure 21. Ground slate lance head (Cat. No. IX-D-435k).
- Figure 22. Ground slate chisel or end-scraper (Cat. No. IX-D-496).
- Figure 23. Long adze blade (Cat. No. IX-D-429).
- Figure 24. Ground slate man's knife (Cat. No. IX-E-9).
- Figure 25. Ground slate man's knife (Cat. No. IX-D-435d).
- Figure 26. Ground slate pie-shaped ulu (Cat. No. IX-D-436e).
- Figure 27. A ground slate stemmed ulu (Cat. No. IX-D-532).



## PLATE IV

(natural size)

(National Museum of Canada Neg. No. J 3293)

- Figure 1. Bladelette (Cat. No. IX-E-58b).
- Figure 2. Bladelette (Cat. No. IX-E-58a).
- Figure 3. Angle burin (Cat. No. IX-E-55).
- Figure 4. Angle burin (Cat. No. IX-E-55).
- Figure 5. Small triangular end-scraper (Cat. No. IX-E-57).
- Figure 6. Lamellar flake with ripple flaking (Cat. No. IX-E-59).
- Figure 7. Thin flake side-scraper (Cat. No. IX-E-64d).
- Figure 8. End-of-the-blade scraper (Cat. No. IX-E-56).
- Figure 9. Lamellar flake (Cat. No. IX-E-74).
- Figure 10. Bone scraper handle (Cat. No. IX-E-65).





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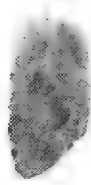
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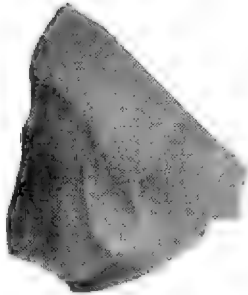
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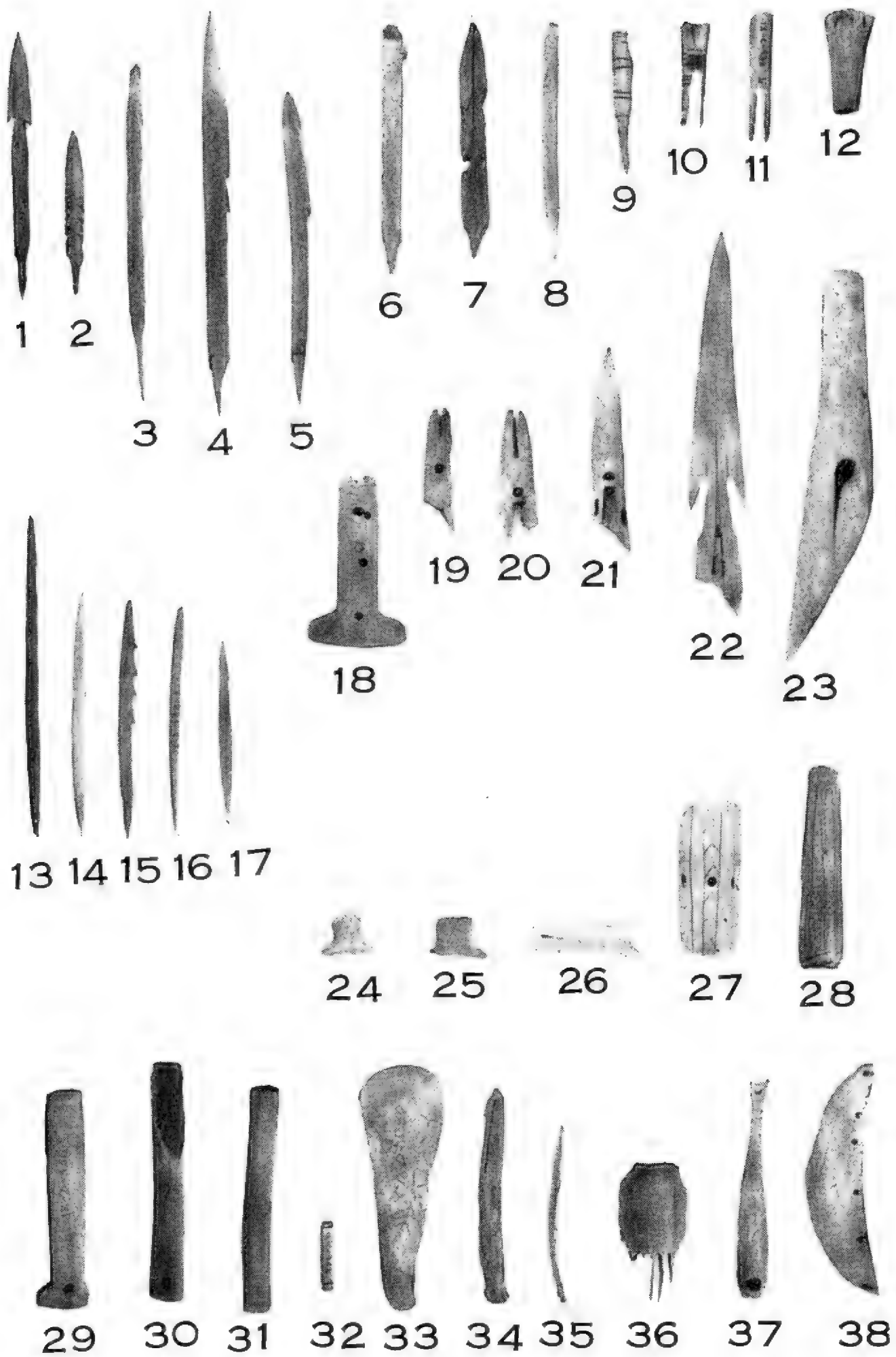
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## PLATE V

(1/4 natural size)

(National Museum of Canada Neg. No. J 3294)

- Figure 1. Unibarbed bilateral bone arrow point (Cat. No. IX-D-438n).
- Figure 2. Quadri-barbed bilateral bone arrow point (Cat. No. IX-D-438e).
- Figure 3. Tri-barbed unilateral bone arrow point (Cat. No. IX-D-438h).
- Figure 4. Bi-barbed unilateral bone arrow point (Cat. No. IX-D-575).
- Figure 5. Unibarbed unilateral bone arrow point (Cat. No. IX-D-438d).
- Figure 6. Unibarbed unilateral bone arrow point with insert slot (Cat. No. IX-D-608).
- Figure 7. Barbless bone arrow point (Cat. No. IX-E-4).
- Figure 8. Pointed base bone arrow bunt (Cat. No. IX-D-608).
- Figure 9. Decorated pointed base bone arrow bunt (Cat. No. IX-D-439c).
- Figure 10. Bifurcated base decorated bone arrow bunt (Cat. No. IX-D-439a).
- Figure 11. Bifurcated base bone arrow bunt (Cat. No. IX-D-439b).
- Figure 12. Hollow-base bone arrow bunt (Cat. No. IX-D-555).
- Figure 13. Tri-barbed unilateral bone leister prong (Cat. No. IX-D-438g).
- Figure 14. Tri-barbed unilateral bone leister prong (Cat. No. IX-D-438o).
- Figure 15. Quadri-barbed unilateral bone leister prong (Cat. No. IX-D-575).
- Figure 16. Five-barbed unilateral bone leister prong (Cat. No. IX-D-438k).
- Figure 17. Unibarbed bilateral bone leister prong (Cat. No. IX-D-522).
- Figure 18. Bone man's knife handle (Cat. No. IX-D-501).
- Figure 19. Thule type IV-A bone harpoon head (Cat. No. IX-D-143).
- Figure 20. Thule type III bone harpoon head (Cat. No. IX-D-607).
- Figure 21. Thule type I bone harpoon head (Cat. No. IX-D-545).
- Figure 22. Thule type II bone harpoon head (Cat. No. IX-E-1).
- Figure 23. Thule type IV bone harpoon head (Cat. No. IX-D-139).
- Figure 24. Stone lip plug (Cat. No. IX-D-142).
- Figure 25. Bone lip plug (Cat. No. IX-D-538).
- Figure 26. Stone lip plug (Cat. No. IX-D-455).
- Figure 27. Bone box top (Cat. No. IX-D-441).
- Figure 28. Bone wedge (Cat. No. IX-E-16).
- Figure 29. T-shaped knife or scraper handle (Cat. No. IX-D-456).
- Figure 30. Scraper handle with a gouged hole (Cat. No. IX-E-36).
- Figure 31. Bone sucking tube (Cat. No. IX-D-589).
- Figure 32. Bone bead (Cat. No. IX-D-445).
- Figure 33. Bone spoon (Cat. No. IX-D-580).
- Figure 34. Bone wound plug (Cat. No. IX-D-583).
- Figure 35. Bone wound plug or needle (Cat. No. IX-E-25).
- Figure 36. Bone comb (Cat. No. IX-D-552).
- Figure 37. Bone fish-hook (Cat. No. IX-D-595).
- Figure 38. Bone snow goggle visor (Cat. No. IX-D-563).



## PLATE VI

 $(\frac{1}{2}$  natural size)

(National Museum of Canada Neg. No. J 3292)

- Figure 1. Bone snow shovel blade (Cat. No. IX-D-476).
- Figure 2. Bone net spacer (Cat. No. IX-D-561).
- Figure 3. Bone arrow straightener (Cat. No. IX-D-497).
- Figure 4. Bone arrow straightener or thong stretcher (Cat. No. IX-D-479).
- Figure 5. Bone adze socket (Cat. No. IX-D-428).
- Figure 6. Bone snow-knife handle (Cat. No. IX-D-520).
- Figure 7. Bone ice pick (Cat. No. IX-D-594).
- Figure 8. Bone beamer (Cat. No. IX-D-464).
- Figure 9. Bone whip handle (Cat. No. IX-D-525).
- Figure 10. Bone mattock head (Cat. No. IX-D-590).
- Figure 11. Bone adze handle (Cat. No. IX-D-577).



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## ARCHÆOLOGICAL INVESTIGATIONS ON SOUTHAMPTON AND COATS ISLANDS, N.W.T.

*By Henry B. Collins*

An expedition, sponsored by the National Museum of Canada, the National Geographic Society, and the Smithsonian Institution, conducted archæological work on Southampton and Coats islands in Hudson Bay during the summer of 1954. Our party, consisting of Dr. J. N. Emerson, Assistant Professor of Anthropology, University of Toronto; Mr. William E. Taylor, Jr., Research Assistant, Museum of Anthropology, University of Michigan; Mr. Eugene Ostroff, photographer, of Washington, D.C.; and the writer, left Montreal by R.C.A.F. aircraft on June 23 and arrived at Coral Harbour the next day. Our primary purpose was to excavate at Native Point, particularly at a Dorset culture site discovered by Mr. W. D. Bell, a member of Dr. J. Brian Bird's geographical expedition of 1950.

Through arrangements made by Mr. A. T. Swaffield, Hudson's Bay post Manager, we left Coral Harbour with four Eskimo dog teams on the afternoon of June 25, and fourteen hours later arrived at Native Point, Tunermiut, 40 miles down the coast.

Tunermiut, the Aivilik Eskimo name for the old village at Native Point, was the principal settlement of the extinct Sadlermiut, the aboriginal Eskimo tribe of Southampton Island. Here, the last of the Sadlermiut died in an epidemic in the winter of 1902-03. The old Sadlermiut village at Native Point is one of the largest archæological sites in the Canadian Arctic. It consists of 85 stone-and-sod house ruins and adjacent middens, more than a hundred stone graves, and a number of house pits and tent rings of the Aivilik Eskimos, who have lived or camped there in more recent years.

The Sadlermiut houses were semi-subterranean, with stone floors and with walls and roofs of stones and turf. The entrance passage, similarly constructed, was at a level slightly lower than the house floor. Whale bones were seldom used in the construction of these houses, thus differing from those previously described elsewhere on Southampton Island. Compared with those of other mammals, very few whale bones were found anywhere around the site—an indication that whaling was unimportant or non-existent at this Sadlermiut settlement. One house, No. 37, was excavated; the midden areas surrounding another house, No. 30, and the house depression itself, were staked off in 5-foot squares and partly excavated (Plate IA). Twenty stone graves containing complete skeletons were excavated, and 15 unassociated skulls were collected from the surface on and around the site. Walrus, polar bear, caribou, and dog skulls, as well as other bones of these animals, occurred in profusion in and around the house ruins. Excavation of the graves and of Houses 30 and 37 and the



midden areas adjacent to them yielded a large collection of Sadlermiut material similar to that previously described by Boas (1901-07) and Mathiassen (1927) from Sadlermiut sites on other parts of Southampton Island. In this preliminary report, only the types of harpoon heads and stone implements are illustrated (Plate XII).

One mile to the east of the Sadlermiut site, and almost a mile back from the present shore, is a much older Dorset culture site which we have called T1, from the name Tunermiut, which the present Aivilik Eskimos apply to the site as a whole. The T1 site, extending over 20 acres, covers the greater part of the flat level surface of an 85-foot-high plateau or headland, the highest elevation for many miles around. The site consists entirely of midden deposits, spread in a flat layer over the top of the plateau, with no house pits, house ruins, or other surface irregularities (Plate IB). The surface vegetation is sparse and dry, consisting mainly of low-growing grasses, saxifrages, dryas, mosses, and lichens, in striking contrast to the dense, lush vegetation covering the Sadlermiut site.

The midden deposits were shallow, at no point deeper than 30 inches; in some places they rested on pure sand, in others on pure gravel or gravel mixed with sand. Excavations were confined to four widely separated areas, called Middens 1, 2, 3, and 4, and to a series of test pits. Stone implements occurred in large numbers—over 3,000 complete or fragmentary artifacts—in addition to great quantities of flakes, chips, and rejected material. A number of the stone implement types were characteristic of the Dorset culture as known from other sites in Canada and Greenland; others were types not previously known from the Dorset or any other American culture. Bone and ivory artifacts were much less numerous. Some of these also were typically Dorset; others were new.

Though generally solid and well preserved, the ivory and bone artifacts were weathered on the surface and uniformly patinated, in contrast to the fresh appearance of those from the Sadlermiut site. Wood, which must have been used for harpoon shafts and many other purposes, had completely disappeared, a further indication of considerable antiquity for the site.

At the eastern end of the old beach line—the second from the shore—on which the Sadlermiut site was situated, we found another Dorset site (T2) buried beneath about a foot of wind-blown sand. The few artifacts found in our limited excavations at this site differed from those at the larger T1 site. This cultural difference and its position at a lower level suggest that the site was later than T1.

Typical artifacts from the two Dorset sites are illustrated on Plates II to XI. Two unfinished harpoon heads with open shaft sockets are shown on Plate II, 1, 7. The other harpoon heads had closed rectangular sockets and were of three types: (1) slender, with one line hole and a bifurcated spur and a sharp tip and no end blade (Plate II, 2-6); (2) short and rather thick, with slit for an end blade, a large central line hole, bifurcated spur, and an abrupt bevelled area on one side from the line hole downward, in which a narrow vertical slot was cut, connecting with the closed rectangular socket (Plate II, 10-14); (3) a heavy form with slit for an end blade, bifurcated spur, one surface flat, into which the single

line hole opens, the other arched with the line hole extending transversely through the thickened body (Plate II, 16-18). The harpoon head shown on Plate II, 19, is one of two (the only two found), at the T2 site. In the shape of a spur, the rectangular socket, the presence of a blade slit, and the line hole with two openings on the same side, this type conforms in general with the one last described, but the shape is different and the line hole does not penetrate through the flat lower surface. This is the form of harpoon head which on typological grounds seems the latest of the Dorset types and the one from which the modern Central Eskimo harpoon head was derived (Collins, 1950). The modern Sadlermiut heads illustrated on Plate XII, 5 to 7, embody the principal features of this late Dorset type—a bifurcated spur, one surface flat and the other arched with the line hole extending through it so that both openings of the line hole are on the same side. The most important difference is that on the modern head the enclosed socket is round instead of rectangular. Three small Sadlermiut heads (Plate XIII, 2-4) might even be regarded as conscious but crude copies of a Dorset head, such as Plate XIII, 1, which was present, no doubt as a relic, in House 30.

Plate II, 20, is a large heavy foreshaft which fits the sockets of such heads as Plate II, 16 and 17. A long slender foreshaft, illustrated on Plate II, 21 and 15, may possibly be the proximal end of another. Plate II, 25, is a broken harpoon socket piece with a deep oval pit for the foreshaft and two encircling grooves at the end. Plate II, 24, is the tip of an implement, possibly a knife or lance, with bed for an end blade and a slot on the opposite side for lashing; Plate II, 22 and 23, are two implements of unknown use, possibly harpoon heads, with line holes and long, shallow open sockets. Plate II, 26, from the T2 site, is a barbed dart or harpoon head with four barbs, a line hole, and enclosed rectangular socket with an opening on one side; 27 has two barbs, a blade slit and a long, wide open socket. The tips of two small slender barbed points are shown in 28 and 29. The three objects (Plate II, 30-32) may be the lower ends of lance heads. Implements with this type of base have been described by Wissler (1918) from Smith Sound and by Knuth (1952) from Peary Land.

Two small knife handles of typical Dorset form, with narrow deep blade sockets, are illustrated on Plate III, 1, 2. The type was not found at T1, though this may have been accidental. The four objects shown on Plate III, 3 to 6, are composite handles, with very small shallow sockets which probably held slender flint spalls such as those illustrated on Plate VII. Implements of unknown use, with a small shallow socket at one end, are shown on Plate III, 7 and 10. Other objects of doubtful function are shown on Plate III, 8, 9, 18, 20, and 25. Plate III, 11, is a large implement, probably a lance head, with a basal socket and groove and a single large slot for a side blade; 12 and 13 are slender sharpened pieces of bone, probably fish gorges. An adze head with enclosed socket for the blade and a bed for the handle is shown on Plate III, 14. Flaking hammers (Plate III, 15-17, 19, 21-23) were one of the most common implement types at T1; 15 and 16 are of ivory, the others of walrus skull bone. Another common type was a flat knife-like ivory implement with thin,

rather sharp edges and a suspension hole at the lower end (Plate III, 26-30); 31 is a reamer, and 32, with its blunt polished end, seems to be a rubbing tool.

Bone needles, next to stone implements, were the most common artifacts found at the T1 site. Typical examples, along with a bone awl, are illustrated on Plate IV, 1 to 13. The needles were made from narrow strips cut from bird wing bones (Plate IV, 14). A piece of a bone ladle, four bird bone tubes, and a ring made of mammal bone are shown on Plate IV, 15 to 20. On Plate IV, 21, is shown a tube or container of some kind, made from the proximal hollow end of a young walrus tusk, with ears carved in relief to indicate a mammal's head; 22, carved from antler, is suggestive of an eider duck's head. Three flat bone discs, with several perforations, and an ivory disc are illustrated on Plate IV, 23 to 26; 27 is a section of a composite bone tube, and 28 and 29 are sections cut from shell. The only realistic animal carvings found are the caribou hoof, the caribou, and the polar bear, shown on Plate IV, 30 to 32. The caribou has a simple decoration of deeply cut straight lines, similar to those on two other ivory objects, 33 and 34. An ivory object of unknown use is shown on Plate IV, 35; 36 is a bone sled runner, with two holes connected by a counter-sunk groove. It is somewhat similar to a sled runner found by Leechman (1948, Plate 29, B, 12) at a Dorset site on Nuvuk Island at the west end of Hudson Strait.

The general impression received from the non-lithic material at T1 is that of a simple but highly individual culture. Most of the recurrent types such as the composite shallow-slotted handles, flaking tools, and flat, thin, knife-like implements (Plate III) and the bone tubes, discs, and pieces of cut shell (Plate IV) are new to the Dorset culture. Similarly, other characteristic Dorset implements are lacking here. The site cannot be equated with any other known Dorset site; it seems to represent a new phase of that culture.

Stone implements far outnumbered those of ivory and bone. Except for a very few blades of rubbed slate (Plate VI, 48-52) and nephrite (Plate VIII, 36-38) and sherds of soapstone vessels, they were all of chert, of which two varieties were observed. One is a smooth, glossy chert that breaks with a conchoidal fracture; the other is more granular or gritty in texture. There was a deliberate and consistent choice in the type of chert to be used for making different types of implements. Most of the blades and other implements were made of the first variety of chert; the gritty, tough-textured form was used mainly in the manufacture of the "burin-like" implements with ground surfaces (Plate VIII, 18-35).

Examples of the triangular projectile points found at T1 are illustrated on Plate V. The typical Dorset form with deeply concave base is conspicuously absent, the nearest approach being those shown on Plate V, 23 and 24. One of the typical Dorset points, however, was found at the Sadlermiut site (Plate XII, 44). As it is totally unlike the other Sadlermiut blades, it may well have been a Dorset relic from the adjacent T2 Dorset site. The T1 projectile points include slender triangular forms, some with notched tangs—a Dorset feature (Plate V, 12-14). Others are wider with straight broad base, resembling in this respect, though not in total contour, some of the end blades of the Denbigh Flint Complex. Most of the triangular shaped T1 blades were probably used for harpoons, as most

of the harpoon heads had blade slits at the end. Some of the blades, from their shape, could have been used as arrow points, but it cannot be proved as yet that any of the Dorset people used the bow and arrow. They did not possess the Eskimo type of bone arrowhead, either with or without an end blade, though the blades could have been attached, Indian-like, directly to the end of a wooden arrow shaft.

Larger end blades, probably for knives and lances, and side blades are shown on Plate VI, 10 to 22 and 24 to 29, 23, with a steep thickened edge, is probably a scraper. A characteristic and unique feature of some of the blades is a slanting base (Plate VI, 19-22). Forms of tangs, mostly with the blade part broken off, are illustrated on Plate VI, 30 to 42, 46, 47. The short wide-tanged examples were probably scrapers. The two asymmetrical knife blades shown on Plate VI, 44, 45, are from the T2 site. The fact that two examples of this characteristic Dorset implement were included in the small collection from T2 and none among the many hundreds of stone blades at T1, seems a significant indication of a cultural and chronological distinction between the two sites, with T2 the later.

Several forms of side blades are illustrated on Plate VII, 1 to 12. The small implements with flakes removed from the upper corner (Plate VII, 13-20) may be considered as burins, inasmuch as the flakes have been carefully removed to provide a working edge, even though the process has not always resulted in leaving a negative bulb of percussion, which European prehistorians regard as the true criterion of a burin. A burin function is also indicated for the larger implements shown on Plate VIII, 40 to 47. Here at the upper end, several vertical or oblique flakes have been struck off from both sides, giving the implement a chisel-like cutting edge (Plate VIII, 42, 43), or a series of smaller flakes removed to produce a gouge or scraper-like edge (Plate VIII, 40, 41, 44-46). The implement shown on Plate VIII, 47, has been given a stout cutting edge by removal of oblique intersecting flakes at the upper end; the edges of the blade are retouched, and the lower end has been fashioned into a projection designed for gouging. Though most of these implements would fail to meet the exacting requirements of a burin in the European sense, the fact remains that a working edge has been produced by the careful removal of flakes from the upper end. There can be little doubt that the cutting edge thus produced was designed for gouging and scoring, so that in function, though not in precise technique, the implements fall into the general category of burins. In Plate VIII, 48 and 49 bear a certain resemblance to the Folsom "graver", with small projecting tips produced by the removal of minute flakes.

One of the most common types at T1 was the well known Dorset artifact that I have called a "burin-like" implement, the ground edges and sides of which intersect at the upper corner to produce a strong sharp cutting point (Plate VIII, 18-38). The lower end was tanged or notched, the upper end bevelled to a sharp edge. In Plate VIII, 29 and 30 are unfinished specimens, which have been shaped by chipping but which have not been ground. These implements were always made of the gritty variety of chert, and the grinding process has invariably resulted in the production



of a white patina. The same white patina is seen on the ground edges and surfaces of the two "adze-like" scrapers shown on Plate VIII, 15, 16, an implement type which is also characteristic of the Old Bering Sea and Ipiutak cultures. Plate VIII, 17, a similar implement but made from the smoother variety of chert, has no patina on its ground edge.

Plate VIII, 1 to 14, illustrates the wide variety of end-scrapers found at T1. The most typical Dorset form, narrow above and with widely expanded lower edge, was not found. Two core-scrapers are shown on Plate VIII, 50 and 51, and a rubbing stone or whetstone in 52. Thin sherds of steatite lamps or cooking pots (Plate VIII, 53-58) were fairly numerous but too small to give any idea of the size or shape of the vessels.

On Plate VII, 21 to 50, is shown a series of very small narrow implements resembling burin spalls. Most of them, however, could not have been the by-product of burin manufacture, as no burins were found from which spalls of this kind could have been struck, particularly the larger examples such as 21 to 30. The spalls were struck from the edges of a variety of blades or even large unmodified flakes, but they are intentional artifacts, carefully produced for a specific purpose, which was that of cutting or grooving; in other words these small slender implements themselves had the function of burins. Many of them are carefully retouched at the upper end to produce a cutting edge. Some of them, examples of which are shown on Plate VII, 36 to 39, 47 to 50, were removed from the lateral edges of the ground "burin-like" implements just described and illustrated on Plate VIII, 18 to 35. Another unique type is illustrated on Plate VII, 40 and 41; these were made from finished bifaced projectile or knife blades, the tips of which still remain. The upper working edge, opposite the tip remnant, was carefully retouched. The smaller spall implements, such as Plate VII, 44 to 46, were probably inserted in the shallow sockets of the composite ivory handles illustrated on Plate III, 3 to 6.

Perhaps the most characteristic implements in the lithic complex of T1 were lamellar flakes, which occurred in great numbers and a wide variety of forms (Plates IX and X). Some of them, with basal tangs, were apparently used as knives; others probably served as side blades. Some have notches chipped in the edge (Plate IX, 3-7), and most of them have one or both edges either deliberately retouched or chipped from use. Many of them have one sharp cutting edge and the opposite edge either thick from the original flake surface or dulled and thickened by chipping, in the manner of the European backed blade (Plate IX, 10-17, 21, 22; Plate X, 1-3, 8). All specimens are illustrated here with the bulb end down, except some of those with tangs. Though lamellar flakes were a highly important element in the stone industry at T1, very few of the parent cores were found. Apparently they were used and reused until exhausted.

Another highly characteristic and unique type of artifact at T1 is illustrated on Plate XI. The outer surface of these flake implements is usually rather carefully worked, the inner bulbar surface unmodified. The shape is generally triangular, with one edge either sharpened by chipping or sharp from the original flake, and the opposite edge either dulled by chipping or thickened by the removal of a longitudinal flake. In some examples, a shorter flake was removed from the upper end opposite the

longer dulled edge. In such instances the implement no longer had a cutting edge; the intention seems to have been to produce a point designed for grooving or engraving. Implements like those shown on Plate XI have not been previously reported from America. In shape and to some extent in technique, they recall some of the microlithic forms of the Mesolithic cultures of Eurasia, particularly the Tardenoisian of western Europe. The significance of this partial resemblance remains to be determined. It would be surprising if these implements should prove to be unique at this one Southampton Island site. Extensive excavations at other microlithic sites in the Arctic will probably reveal comparable examples and make it possible to trace firmer connections with Old World cultures.

All faunal remains from the excavations were preserved. The many bird bones and the occasional fish bones and molluscs were brought back to the U.S. National Museum for identification. Mammal bones excavated at the Sadlermiut site and T1 numbered over 45,000, and of these some 6,000 were identified in the field. The result was the demonstration of some striking differences in the food economy of the two peoples. The seal was the most important food animal of both peoples, represented by 68 and 64 per cent of the identified bones, respectively, at T1 and the Sadlermiut site. Next came the walrus, 10·2 per cent at T1, and 5·2 per cent at the Sadlermiut site. Bearded seal bones occurred in about the same proportion—10 per cent and 7·1 per cent. Polar bear bones were scarce: 0·1 per cent at T1 and 1·3 per cent at the Sadlermiut site. One somewhat surprising result of the bone count was evidence that the Dorset people made little use of caribou—one half of one per cent in contrast to 11·5 per cent of caribou bones at the Sadlermiut site. Fox bones were more numerous at T1, 10·6 per cent as compared with 2·6 per cent, but dog bones were completely lacking. The absence of dog bones is evidence that the Dorset people had no dog sleds and therefore no effective means of winter travel. This was probably the reason they got so few caribou, for lacking the mobility of the later Sadlermiut, who possessed the dog sled, they would have been unable to make long trips to the east side of the Island where the caribou mostly ranged.

On July 18 an Eskimo Peterhead boat came from Coral Harbour to take us over to Coats Island. We excavated two of four house ruins at a small recent Sadlermiut site on the north coast directly opposite Bencas Island and examined two other house ruins near the northeastern end of Bencas. Late in August we returned to Coral Harbour by Peterhead and were flown to Montreal, via Churchill, by the R.C.A.F. Plans have been made to return to Southampton Island in June 1955 for another season of work at Native Point.

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## PLATE I

- A. Beginning excavation of House 30 and surrounding midden areas, Sadlermiut site, Native Point. Mammal bones from the excavation are shown in the foreground.
- B. View of T1, the Dorset culture site on 85-foot elevation about one mile from sea, Native Point. Four of the squares of Midden 1 are shown during excavation.



A

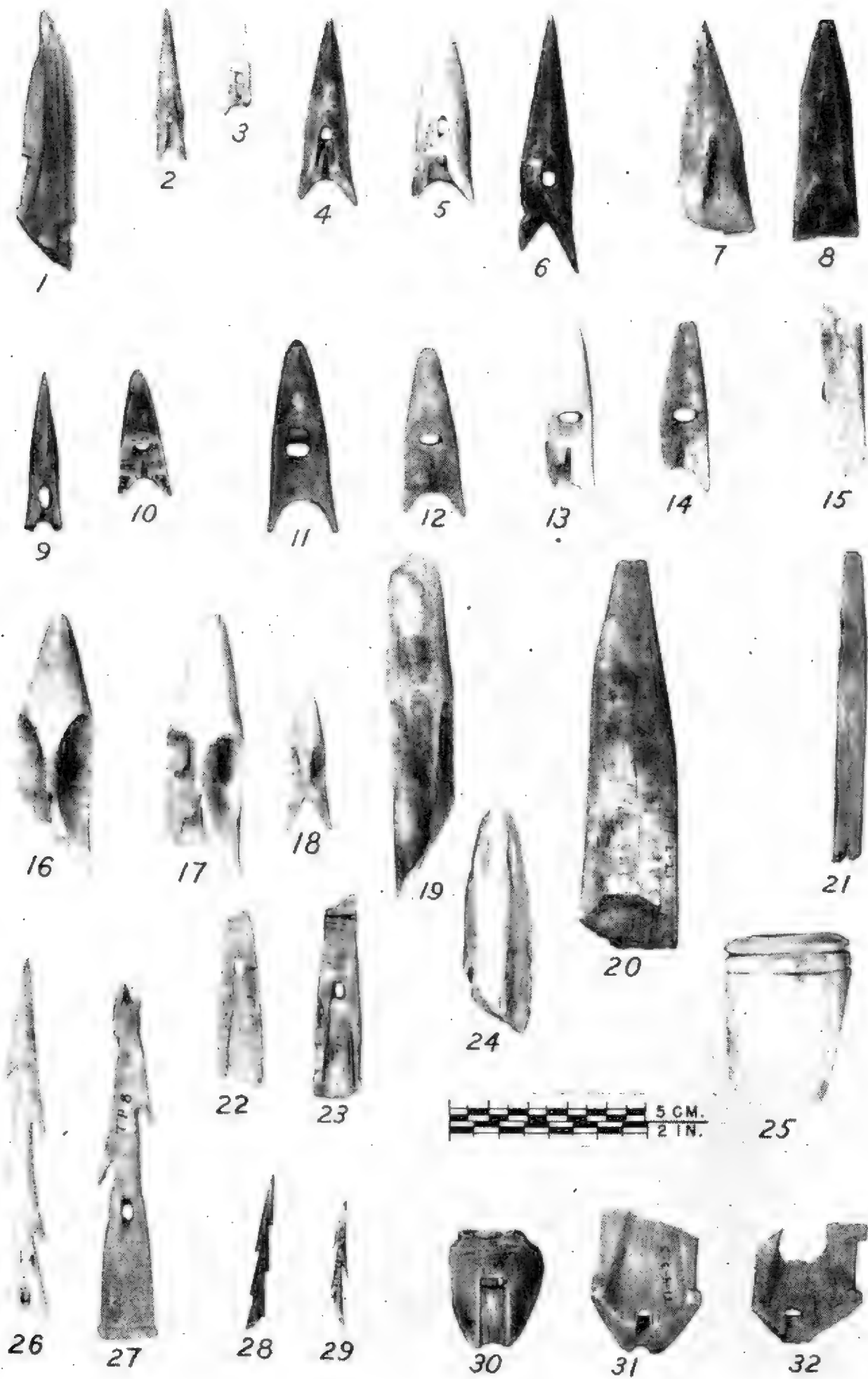


B

## PLATE II

( $\frac{1}{2}$  natural size)

- |  |                                    |
|--|------------------------------------|
| Figure 1. Unfinished harpoon head, ivory             | T1, Midden 1, square 2, level 1    |
| Figure 2. Harpoon head, ivory                        | T1, Midden 2, square 2, level 2    |
| Figure 3. Harpoon head, toy, ivory                   | T1, Midden 1, wall, level 3        |
| Figure 4. Harpoon head, ivory                        | T1, Midden 1, square 5, level 1    |
| Figure 5. Harpoon head, ivory                        | T1, Midden 1, wall, level 1        |
| Figure 6. Harpoon head, ivory                        | T1, Midden 2, square 2, level 2    |
| Figure 7. Unfinished harpoon head, ivory             | T1, Midden 1, square 5, level 2    |
| Figure 8. Unfinished harpoon head, ivory             | T1, Midden 1, square 5, level 1    |
| Figure 9. Harpoon head, ivory                        | T1, Midden 2, square 2, level 2    |
| Figure 10. Harpoon head, ivory                       | T1, Midden 1, square 5, level 1    |
| Figure 11. Harpoon head, ivory                       | T1, Midden 1, square 2, level 2    |
| Figure 12. Harpoon head, ivory                       | T1, Test Pit 8                     |
| Figure 13. Harpoon head, ivory                       | T1, Midden 1, square 2, level 3    |
| Figure 14. Harpoon head, ivory                       | T1, Midden 4, square 3, level 1    |
| Figure 15. Piece of harpoon foreshaft (?), ivory     | T1, Midden 1, wall, level 1        |
| Figure 16. Harpoon head, ivory                       | T1, Midden 1, square 6, level 2    |
| Figure 17. Harpoon head, ivory                       | T1, Midden 1, square 2, level 2    |
| Figure 18. Harpoon head, ivory                       | T1, Midden 2, square 3, level 1    |
| Figure 19. Harpoon head, ivory                       | T2, Test Pit 10, square 1, level 2 |
| Figure 20. Harpoon foreshaft, ivory                  | T1, Midden 1, square 2, level 2    |
| Figure 21. Harpoon foreshaft (?), ivory              | T1, Midden 1, square 3, level 3    |
| Figure 22. Harpoon or lance head (?), ivory          | T1, Midden 2, square 5, level 2    |
| Figure 23. Harpoon or lance head (?), ivory          | T1, Midden 1, square 7, level 1    |
| Figure 24. Tip of harpoon or lance head (?), ivory   | T1, Midden 1, wall, level 2        |
| Figure 25. End of harpoon socket piece, ivory        | T1, Midden 2, Surface              |
| Figure 26. Barbed harpoon head, ivory                | T2, Surface                        |
| Figure 27. Barbed harpoon head, ivory                | T1, Test Pit 8                     |
| Figure 28. Piece of barbed fish or bird spear, ivory | T1, Midden 2, square 1, level 2    |
| Figure 29. Piece of barbed fish or bird spear, ivory | T1, Midden 1, square 1, level 2    |
| Figure 30. Basal end of lance (?), ivory             | T1, Midden 1, square 6, level 2    |
| Figure 31. Basal end of lance (?), ivory             | T1, Midden 4, square 3, level 3    |
| Figure 32. Basal end of lance (?), ivory             | T1, Midden 1, square 1, level 3    |

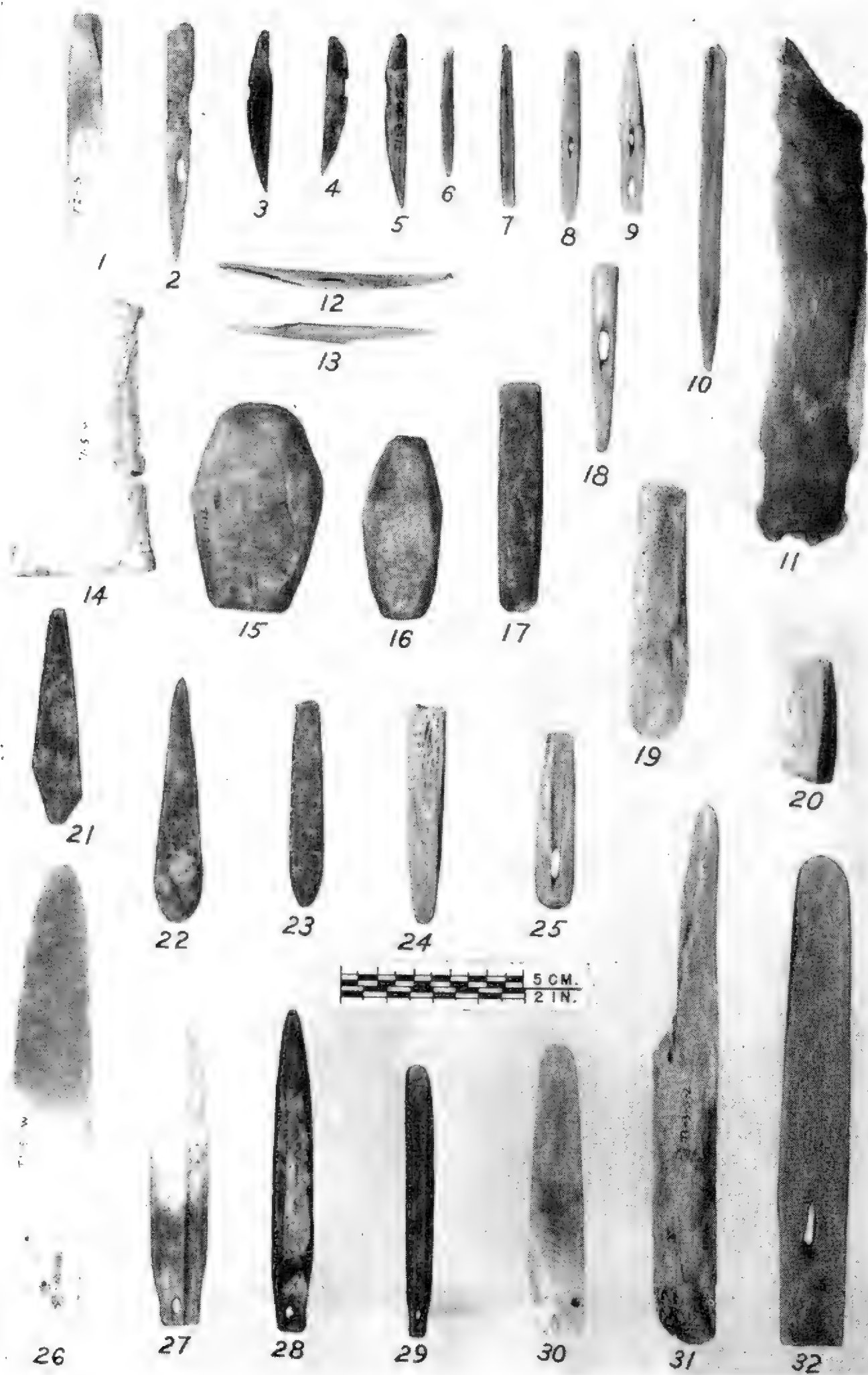


## PLATE III

(½ natural size)

- |   |                                    |
|---|------------------------------------|
| Figure 1. Knife handle, antler                | T2, Surface                        |
| Figure 2. Knife handle, ivory                 | T2, Test Pit 10, square 1, level 2 |
| Figure 3. Composite handle, ivory             | T1, Midden 2, square 2, level 1    |
| Figure 4. Composite handle, ivory             | T1, Midden 2, square 1, level 1    |
| Figure 5. Composite handle, ivory             | T1, Midden 2, square 2, level 2    |
| Figure 6. Composite handle, ivory             | T1, Midden 3, square 1, level 2    |
| Figure 7. Ivory object                        | T1, Midden 1, square 3, level 1    |
| Figure 8. Ivory object, perforated            | T1, Midden 1, square 3, level 2    |
| Figure 9. Ivory object, perforated            | T1, Midden 1, square 2, level 3    |
| Figure 10. Bone object                        | T1, Midden 1, square 1, level 2    |
| Figure 11. Bone object with side blade socket | T1, Midden 1, square 5, level 1    |
| Figure 12. Fish gorge (?), bone               | T1, Midden 2, square 2, level 2    |
| Figure 13. Fish gorge (?), ivory              | T1, Midden 1, square 1, level 2    |
| Figure 14. Adze socket, antler                | T1, Surface, west                  |
| Figure 15. Flaking hammer, ivory              | T1, Midden 1, square 7, level 3    |
| Figure 16. Flaking hammer, ivory              | T1, Midden 1, square 6, level 2    |
| Figure 17. Flaking hammer, bone               | T1, Midden 1, square 2, level 1    |
| Figure 18. Ivory object, perforated           | T1, Midden 1, square 5, level 1    |
| Figure 19. Flaking hammer, bone               | T1, Test Pit 8                     |
| Figure 20. Bone object                        | T1, Midden 1, square 5, level 1    |
| Figure 21. Flaking hammer, bone               | T1, Midden 2, square 1, level 1    |
| Figure 22. Flaking hammer, bone               | T1, Midden 2, square 1, level 1    |
| Figure 23. Flaking hammer, bone               | T1, Midden 2, square 8, level 2    |
| Figure 24. Bone object                        | T1, Midden 1, wall, level 2        |
| Figure 25. Ivory object                       | T1, Test Pit 1, level 2            |
| Figure 26. Ivory knife                        | T1, Surface, west                  |
| Figure 27. Ivory knife                        | T1, Surface, west                  |
| Figure 28. Ivory knife                        | T1, Midden 2, square 2, level 1    |
| Figure 29. Spatulate ivory object             | T1, Midden 2, square 1, level 2    |
| Figure 30. Spatulate ivory object             | T1, Surface, west                  |
| Figure 31. Reamer, bone                       | T1, Midden 3, square 5, level 2    |
| Figure 32. Bone object                        | T1, Midden 1, square 5, level 1    |





## PLATE IV

(½ natural size)

Figure 1. Bone awl	T1, Midden 1, square 3, level 1
Figure 2. Bone needle	T1, Midden 2, square 6, level 1
Figure 3. Bone needle	T1, Midden 2, square 8, level 2
Figure 4. Bone needle	T1, Midden 1, square 5, level 2
Figure 5. Bone needle	T1, Midden 1, wall, level 3
Figure 6. Bone needle	T1, Midden 2, square 1, level 1
Figure 7. Bone needle	T1, Midden 2, square 1, level 2
Figure 8. Bone needle	T1, Midden 1, square 6, level 2
Figure 9. Bone needle	T1, Midden 3, square 1, level 2
Figure 10. Bone needle	T1, Midden 1, square 4, level 3
Figure 11. Bone needle	T1, Midden 1, square 1, level 1
Figure 12. Bone needle	T1, Midden 1, square 6, level 2
Figure 13. Bone needle	T1, Midden 3, square 5, level 1
Figure 14. Bird bone from which needles were cut	T1, Midden 1, square 1, level 1
Figure 15. Piece of ladle, antler	T1, Midden 1, square 4, level 2
Figure 16. Tube, bird bone	T1, Midden 2, square 1, level 2
Figure 17. Tube, bird bone	T1, Midden 2, square 1, level 1
Figure 18. Perforated tube, bird bone	T1, Midden 1, square 6, level 1
Figure 19. Tube, bird bone	T1, Midden 2, square 7, level 1
Figure 20. Bone ring, mammal bone	T1, Midden 2, square 4, level 1
Figure 21. Ivory container	T1, Midden 1, square 4, level 2
Figure 22. Carved antler object	T1, Midden 2, square 5, level 2
Figure 23. Perforated bone disc	T1, Midden 1, square 6, level 1
Figure 24. Perforated bone disc	T1, Midden 2, square 1, level 1
Figure 25. Perforated bone disc	T1, Midden 2, square 1, level 1
Figure 26. Ivory disc	T1, Midden 2, square 5, level 1
Figure 27. Piece of antler tube (?)	T1, Midden 1, square 2, level 2
Figure 28. Piece of carved shell	T1, Midden 1, wall, level 3
Figure 29. Piece of carved shell	T1, Midden 1, square 2, level 2
Figure 30. Carving of caribou hoof, ivory	T1, Midden 1, square 6, level 1
Figure 31. Carving of caribou, ivory	T1, Midden 1, square 1, level 2
Figure 32. Carving of polar bear, ivory	T1, Midden 2, square 3, level 1
Figure 33. Carved object, ivory	T1, Midden 2, square 8, level 1
Figure 34. Carved object, ivory	T1, Midden 2, square 1, level 1
Figure 35. Ivory object	T1, Midden 4, square 3, level 2
Figure 36. Sled runner, bone	T1, Midden 2, square 3, level 2

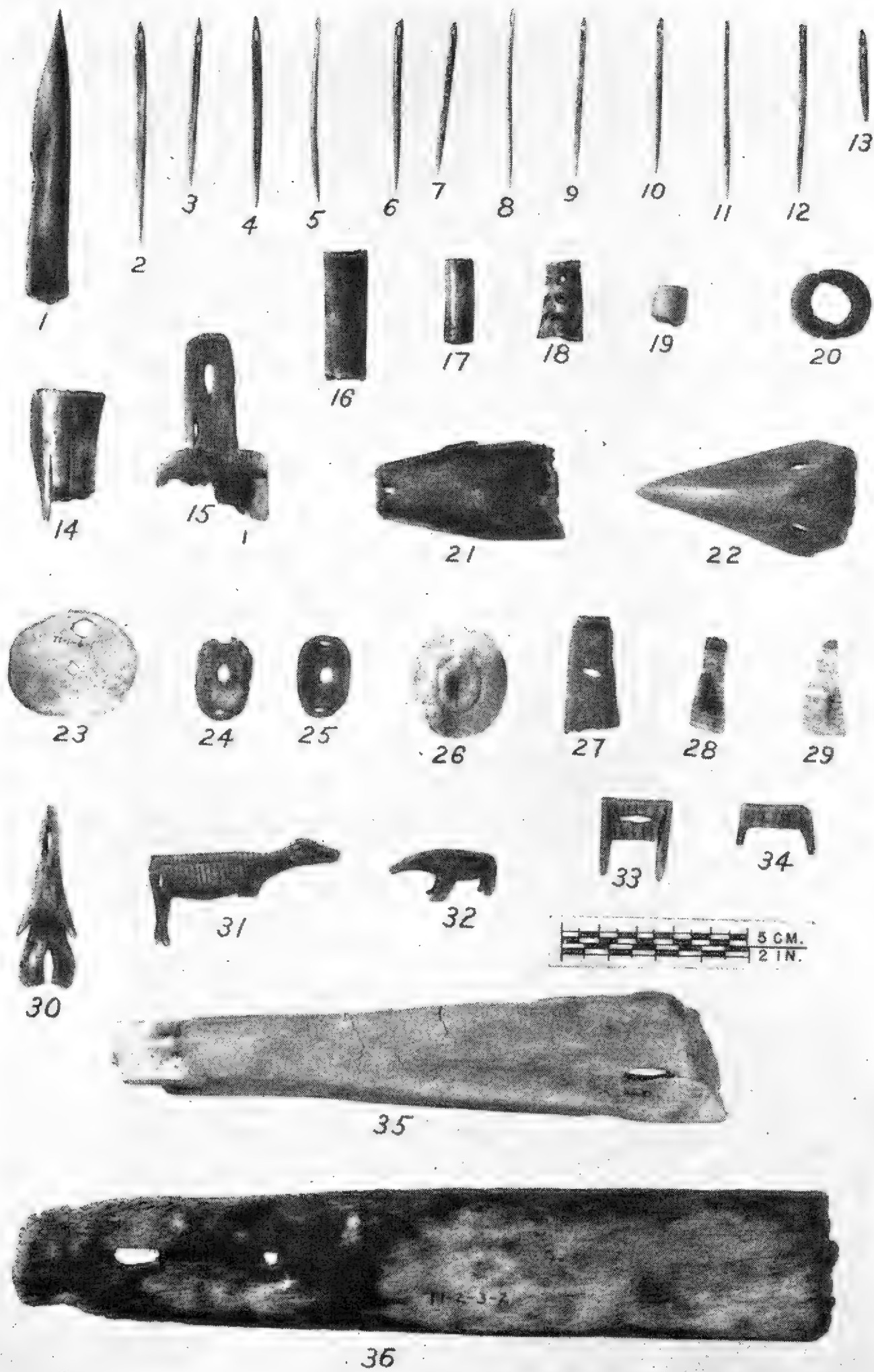
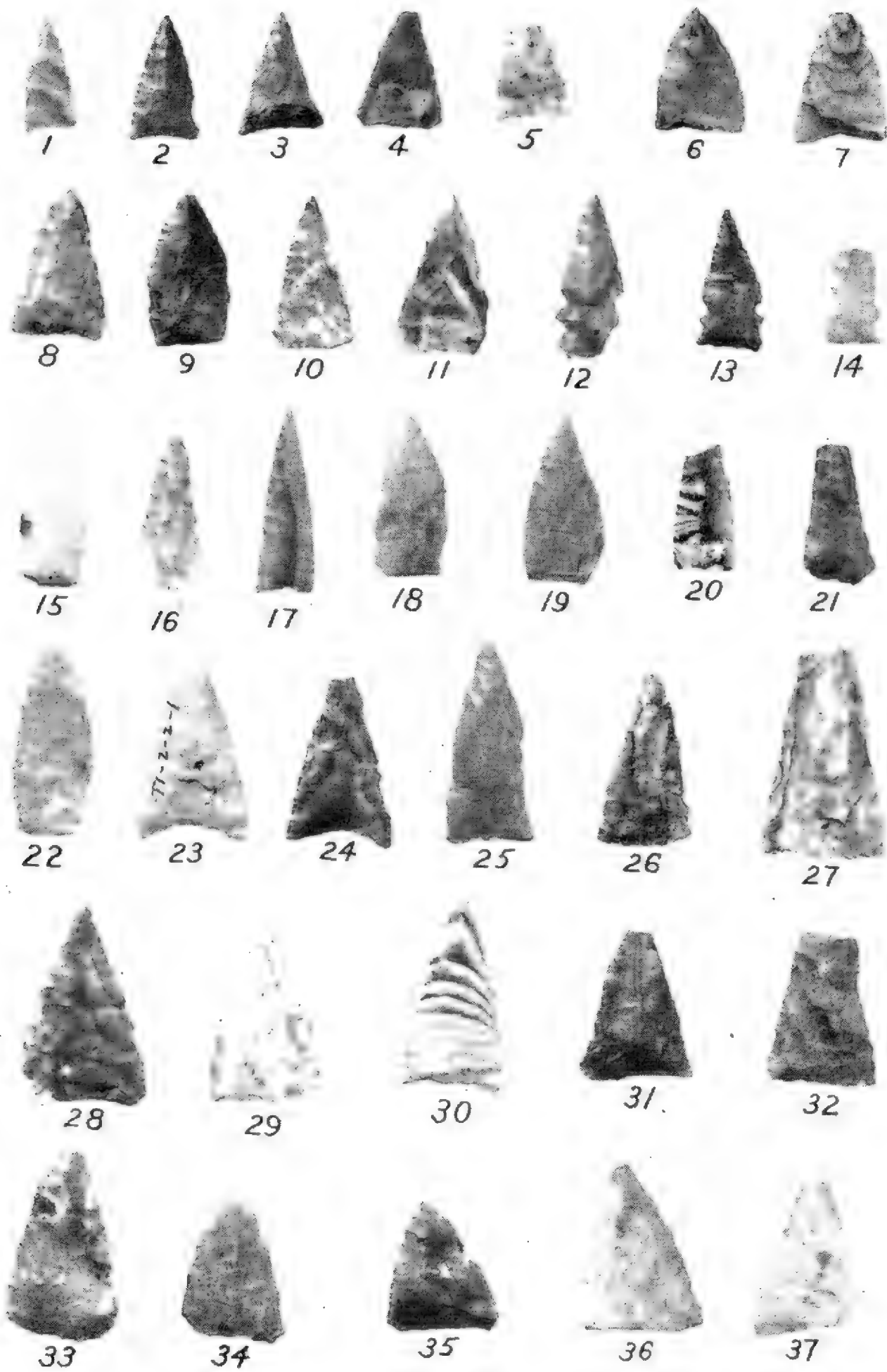


PLATE V  
(Natural size)

Figure 1. Projectile point, chert  
 Figure 2. Projectile point, chert  
 Figure 3. Projectile point, chert  
 Figure 4. Projectile point, chert  
 Figure 5. Projectile point, chert  
 Figure 6. Projectile point, chert  
 Figure 7. Projectile point, chert  
 Figure 8. Projectile point, chert  
 Figure 9. Projectile point, chert  
 Figure 10. Projectile point, chert  
 Figure 11. Projectile point, chert  
 Figure 12. Projectile point, chert  
 Figure 13. Projectile point, chert  
 Figure 14. Projectile point, chert  
 Figure 15. Projectile point, chert  
 Figure 16. Projectile point, chert  
 Figure 17. Projectile point, chert  
 Figure 18. Projectile point, chert  
 Figure 19. Projectile point, chert  
 Figure 20. Projectile point, chert  
 Figure 21. Projectile point, chert  
 Figure 22. Projectile point, chert  
 Figure 23. Projectile point, chert  
 Figure 24. Projectile point, chert  
 Figure 25. Projectile point, chert  
 Figure 26. Projectile point, chert  
 Figure 27. Projectile point, chert  
 Figure 28. Projectile point, chert  
 Figure 29. Projectile point, chert  
 Figure 30. Projectile point, chert  
 Figure 31. Projectile point, chert  
 Figure 32. Projectile point, chert  
 Figure 33. Projectile point, chert  
 Figure 34. Projectile point, chert  
 Figure 35. Projectile point, chert  
 Figure 36. Projectile point, chert  
 Figure 37. Projectile point, chert

T1, Midden 1, wall, level 2  
 T1, Midden 2, square 4, level 1  
 T1, Midden 1, square 3, level 3  
 T1, Midden 1, square 2, level 3  
 T1, Midden 1, square 6, level 1  
 T1, Midden 1, square 1, level 3  
 T1, Midden 2, square 8, level 2  
 T1, Midden 1, square 1, level 2  
 T1, Midden 1, wall, level 3  
 T1, Test Pit 8  
 T1, Midden 1, square 2, level 3  
 T1, Midden 2, square 1, level 1  
 T1, Midden 1, square 6, level 2  
 T1, Midden 3, square 5, level 2  
 T1, Midden 2, square 4, level 1  
 T1, Midden 2, square 5, level 1  
 T1, Test Pit 2  
 T1, Midden 1, square 2, level 3  
 T1, Midden 1, square 1, level 3  
 T1, Midden 2, square 4, level 1  
 T1, Midden 1, square 4, level 2  
 T1, Midden 1, square 7, level 2  
 T1, Midden 2, square 2, level 1  
 T1, Midden 1, square 2, level 1  
 T1, Midden 2, square 7, level 1  
 T1, Midden 1, square 6, level 1  
 T1, Midden 3, square 5, level 2  
 T1, Midden 1, square 1, level 2  
 T1, Midden 4, square 3, level 2  
 T2, Surface  
 T1, Midden 1, square 2, level 3  
 T1, Midden 1, square 3, level 1  
 T1, Midden 3, square 5, level 1  
 T1, Midden 1, square 1, level 3  
 T1, Midden 1, square 6, level 2  
 T1, Midden 1, square 1, level 2  
 T1, Midden 1, square 6, level 1



## PLATE VI

( $\frac{1}{2}$  natural size)

- |   |                                 |
|---|---------------------------------|
| Figure 1. Narrow triangular blade, chert          | T1, Midden 2, square 1, level 1 |
| Figure 2. Narrow triangular blade, chert          | T1, Midden 2, square 2, level 2 |
| Figure 3. Narrow triangular blade, chert          | T1, Surface, south              |
| Figure 4. Narrow triangular blade, chert          | T1, Midden 2, square 1, level 1 |
| Figure 5. Narrow triangular blade, chert          | T1, Surface                     |
| Figure 6. Narrow blade, concave base, chert       | T1, Midden 3, square 5, level 2 |
| Figure 7. Blade, chert                            | T1, Surface, west               |
| Figure 8. Blade, chert                            | T1, Surface, north              |
| Figure 9. Blade, chert                            | T1, Midden 2, square 1, level 1 |
| Figure 10. Blade, chert                           | T1, Midden 2, square 1, level 1 |
| Figure 11. Blade, chert                           | T1, Test Pit 1, level 1         |
| Figure 12. Blade, chert                           | T1, Midden 4, square 3, level 1 |
| Figure 13. Blade, chert                           | T1, Midden 1, square 2, level 1 |
| Figure 14. Blade, chert                           | T1, Midden 2, square 2, level 2 |
| Figure 15. Blade, chert                           | T1, Test Pit 11                 |
| Figure 16. Blade, chert                           | T1, Midden 4, square 3, level 1 |
| Figure 17. Blade, chert                           | T1, Midden 4, square 3, level 2 |
| Figure 18. Blade, slanting base, chert            | T1, Midden 4, square 2, level 1 |
| Figure 19. Blade, slanting base, chert            | T1, Midden 4, square 3, level 1 |
| Figure 20. Blade, slanting base, chert            | T1, Midden 4, square 3, level 2 |
| Figure 21. Blade, slanting base, chert            | T1, Midden 1, wall, level 3     |
| Figure 22. Blade, slanting base, chert            | T1, Midden 1, square 2, level 3 |
| Figure 23. Blade, slanting base, chert            | T1, Midden 1, square 1, level 1 |
| Figure 24. Side blade, chert                      | T1, Midden 4, square 3, level 1 |
| Figure 25. Side blade, chert                      | T1, Test Pit 1, level 2         |
| Figure 26. Blade, chert                           | T1, Midden 4, square 2, level 2 |
| Figure 27. Disc-shaped blade, chert               | T1, Midden 1, wall, level 3     |
| Figure 28. Disc-shaped blade, chert               | T1, Midden 1, square 5, level 2 |
| Figure 29. Disc shaped blade, chert               | T1, Midden 1, square 2, level 1 |
| Figure 30. Tanged knife or scraper, chert         | T1, Midden 2, square 4, level 1 |
| Figure 31. Tanged knife or scraper, chert         | T1, Midden 1, square 1, level 3 |
| Figure 32. Tanged knife or scraper, chert         | T1, Midden 2, square 8, level 1 |
| Figure 33. Tanged scraper, chert                  | T1, Midden 1, square 2, level 2 |
| Figure 34. Tanged scraper, chert                  | T1, Midden 2, square 8, level 2 |
| Figure 35. Tanged scraper, chert                  | T1, Midden 4, square 3, level 2 |
| Figure 36. Tanged base of knife or scraper, chert | T1, Midden 1, square 5, level 2 |
| Figure 37. Tanged base of knife or scraper, chert | T1, Midden 3, square 8, level 2 |
| Figure 38. Tanged base of knife or scraper, chert | T1, Midden 2, square 5, level 1 |
| Figure 39. Tanged base of knife or scraper, chert | T1, Midden 2, square 8, level 2 |
| Figure 40. Tanged base of knife or scraper, chert | T1, Test Pit 8                  |
| Figure 41. Tanged base of knife or scraper, chert | T1, Midden 3, square 8, level 2 |
| Figure 42. Tanged base of knife or scraper, chert | T1, Midden 3, square 1, level 2 |
| Figure 43. Blade, engraving tool, chert           | T1, Midden 2, square 1, level 2 |
| Figure 44. Asymmetrical knife blade, chert        | T2, Surface                     |
| Figure 45. Asymmetrical knife blade, chert        | T2, Surface                     |
| Figure 46. Knife tang                             | T1, Midden 1, square 7, level 2 |
| Figure 47. Perforator                             | T1, Midden 2, square 8, level 1 |
| Figure 48. Piece of rubbed slate blade            | T1, Midden 1, square 5, level 1 |
| Figure 49. Piece of rubbed slate blade            | T1, Midden 4, square 2, level 1 |
| Figure 50. Piece of rubbed slate blade            | T1, Midden 4, square 3, level 1 |
| Figure 51. Rubbed slate blade                     | T1, Midden 1, square 7, level 2 |
| Figure 52. Rubbed slate blade                     | T1, Midden 1, square 7, level 2 |
| Figure 53. Piece of rubbed slate blade            | T1, Midden 1, wall, level 2     |



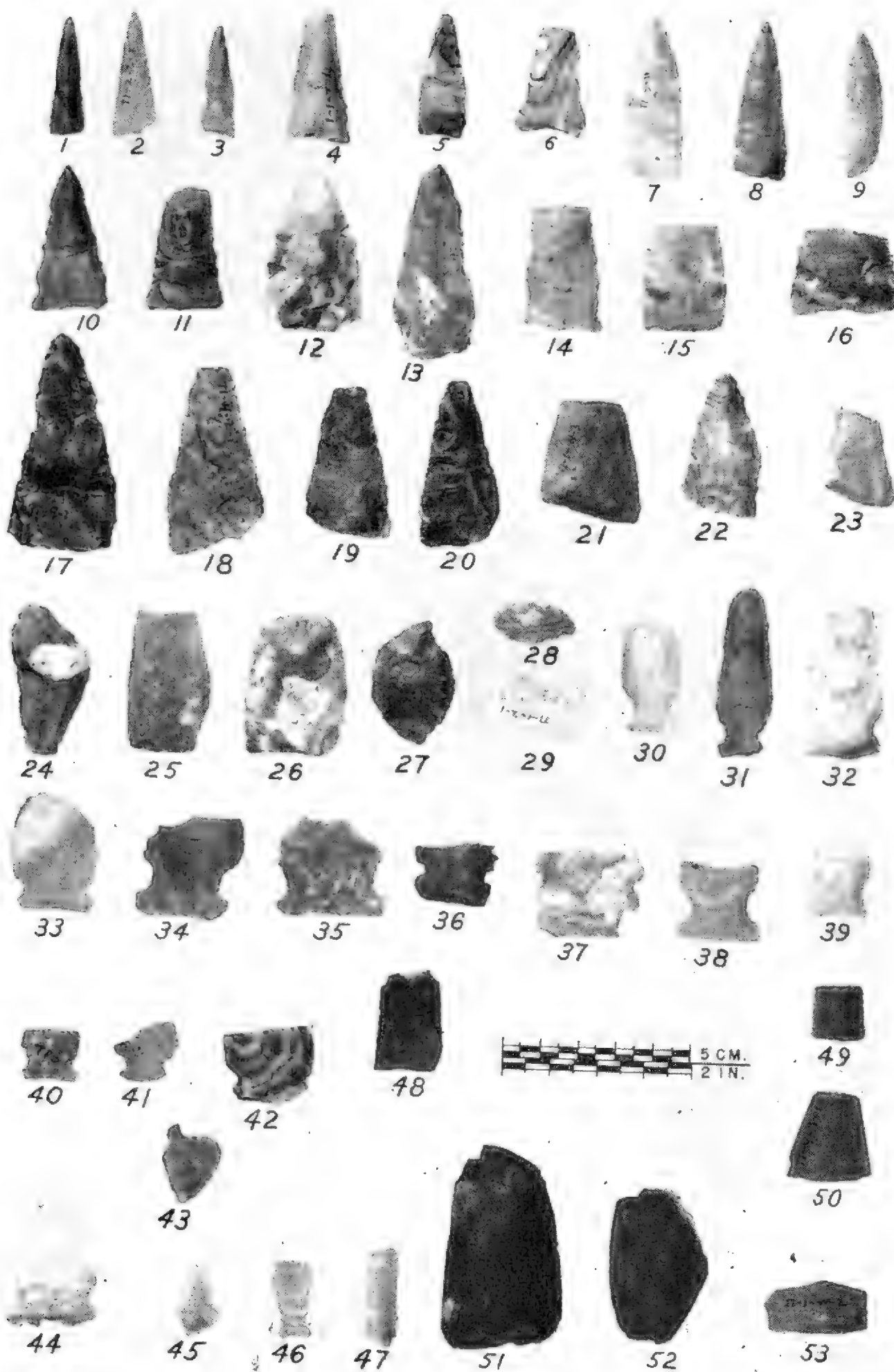
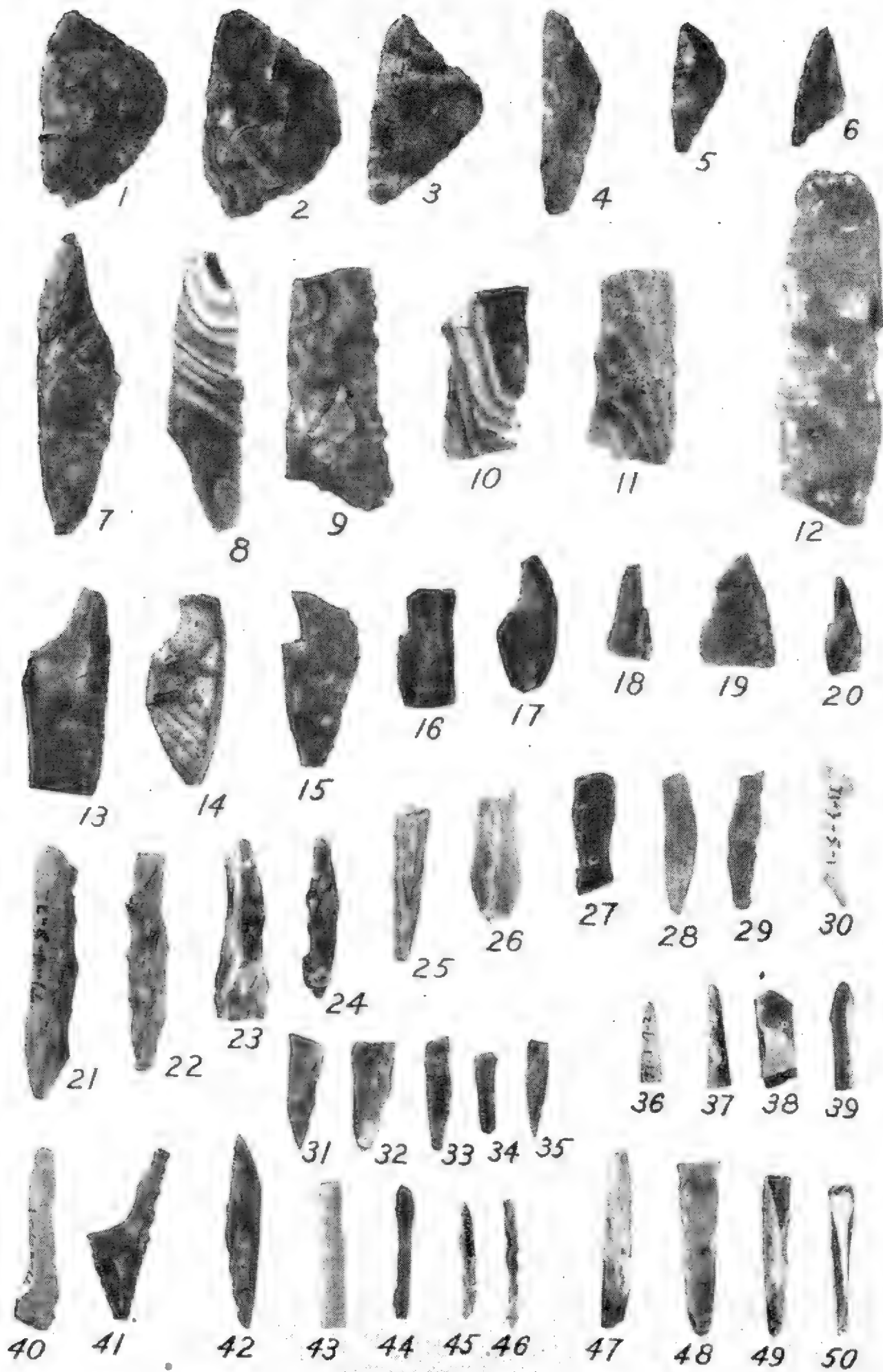


PLATE VII  
(Natural size)

Figure 1. Side blade, chert  
 Figure 2. Side blade, chert  
 Figure 3. Side blade, chert  
 Figure 4. Side blade, chert  
 Figure 5. Side blade, chert  
 Figure 6. Side blade, chert  
 Figure 7. Side blade (?), chert  
 Figure 8. Side blade (?), chert  
 Figure 9. Side blade, chert  
 Figure 10. Side blade, chert  
 Figure 11. Side blade, chert  
 Figure 12. Side blade, chert  
 Figure 13. Burin, chert  
 Figure 14. Burin, chert  
 Figure 15. Burin, chert  
 Figure 16. Micro-burin, chert  
 Figure 17. Micro-burin, chert  
 Figure 18. Micro-burin, chert  
 Figure 19. Micro-burin, chert  
 Figure 20. Micro-burin, chert  
 Figure 21. Spall, chert  
 Figure 22. Spall, chert  
 Figure 23. Spall, chert  
 Figure 24. Spall, chert  
 Figure 25. Spall, chert  
 Figure 26. Spall, chert  
 Figure 27. Spall, chert  
 Figure 28. Spall, chert  
 Figure 29. Spall, chert  
 Figure 30. Spall, chert  
 Figure 31. Spall, chert  
 Figure 32. Spall, chert  
 Figure 33. Spall, chert  
 Figure 34. Spall, chert  
 Figure 35. Spall, chert  
 Figure 36. Spall, chert  
 Figure 37. Spall, chert  
 Figure 38. Spall, chert  
 Figure 39. Spall, chert  
 Figure 40. Spall, chert  
 Figure 41. Spall, chert  
 Figure 42. Spall, chert  
 Figure 43. Spall, chert  
 Figure 44. Spall, chert  
 Figure 45. Spall, chert  
 Figure 46. Spall, chert  
 Figure 47. Spall, chert  
 Figure 48. Spall, chert  
 Figure 49. Spall, chert  
 Figure 50. Spall, chert

T1, Midden 1, square 1, level 1  
 T1, Midden 3, square 5, level 1  
 T1, Midden 1, square 7, level 2  
 T1, Midden 1, square 2, level 2  
 T1, Midden 1, square 5, level 2  
 T1, Midden 1, square 3, level 2  
 T1, Midden 3, square 1, level 1  
 T1, Midden 1, square 1, level 3  
 T1, Midden 4, square 1, level 1  
 T1, Midden 4, square 3, level 1  
 T1, Midden 3, square 5, level 1  
 T1, Midden 4, square 2, level 1  
 T1, Midden 1, square 3, level 2  
 T1, Midden 1, square 2, level 2  
 T1, Midden 3, square 5, level 2  
 T1, Midden 1, square 3, level 1  
 T1, Midden 1, square 2, level 2  
 T1, Midden 1, wall, level 1  
 T1, Midden 1, square 4, level 2  
 T1, Midden 1, wall, level 3  
 T1, Midden 4, square 3, level 2  
 T1, Midden 1, square 1, level 3  
 T1, Midden 1, square 5, level 1  
 T1, Midden 4, square 3, level 2  
 T1, Midden 1, square 6, level 1  
 T1, Midden 3, square 5, level 1  
 T1, Midden 3, square 5, level 2  
 T1, Midden 1, square 2, level 2  
 T1, Midden 4, square 3, level 1  
 T1, Midden 3, square 5, level 1  
 T1, Midden 1, square 1, level 1  
 T1, Midden 1, wall, level 2  
 T1, Midden 1, wall, level 3  
 T1, Midden 3, square 1, level 2  
 T1, Midden 3, square 5, level 2  
 T1, Midden 1, square 7, level 2  
 T1, Midden 1, wall, level 2  
 T1, Midden 1, square 2, level 2  
 T1, Midden 3, square 5, level 1  
 T1, Midden 2, square 1, level 1  
 T1, Midden 2, square 1, level 1  
 T1, Midden 1, square 2, level 2  
 T1, Surface, north  
 T1, Midden 2, square 3, level 1  
 T1, Midden 1, square 6, level 3  
 T1, Midden 3, square 1, level 2  
 T1, Midden 1, square 3, level 3  
 T1, Midden 1, square 6, level 2  
 T1, Midden 1, square 5, level 2  
 T1, Midden 3, square 1, level 1



## PLATE VIII

( $\frac{1}{2}$  natural size)

- |  |                                 |
|--|---------------------------------|
| Figure 1. End-scraper, chert                       | T1, Midden 3, square 5, level 1 |
| Figure 2. End-scraper, chert                       | T1, Midden 1, square 5, level 1 |
| Figure 3. End-scraper, chert                       | T1, Midden 1, square 3, level 1 |
| Figure 4. End-scraper, chert                       | T1, Midden 1, square 3, level 1 |
| Figure 5. End-scraper, chert                       | T1, Midden 2, square 2, level 2 |
| Figure 6. End-scraper, chert                       | T1, Midden 1, wall, level 2     |
| Figure 7. End-scraper, chert                       | T1, Midden 3, square 5, level 2 |
| Figure 8. End-scraper, chert                       | T1, Midden 4, square 1, level 1 |
| Figure 9. End-scraper, chert, unfinished           | T1, Test Pit 8                  |
| Figure 10. End-scraper, chert                      | T1, Midden 4, square 2, level 2 |
| Figure 11. End-scraper, chert                      | T1, Midden 1, square 4, level 2 |
| Figure 12. End-scraper, quartz                     | T1, Midden 2, square 1, level 1 |
| Figure 13. End-scraper, chert, keel shape          | T1, Midden 1, square 2, level 3 |
| Figure 14. End-scraper, chert                      | T1, Midden 1, square 6, level 3 |
| Figure 15. Adze-like scraper, chert, bevelled edge | T1, Test Pit 8                  |
| Figure 16. Adze-like scraper, chert, bevelled edge | T1, Midden 4, square 2, level 1 |
| Figure 17. Adze-like scraper, chert, bevelled edge | T1, Midden 4, square 3, level 2 |
| Figure 18. Burin-like implement, chert             | T1, Midden 2, square 8, level 1 |
| Figure 19. Burin-like implement, chert             | T1, Midden 2, square 1, level 2 |
| Figure 20. Burin-like implement, chert             | T1, Midden 2, square 1, level 1 |
| Figure 21. Burin-like implement, chert             | T1, Midden 1, square 5, level 3 |
| Figure 22. Burin-like implement, chert             | T1, Midden 1, square 6, level 1 |
| Figure 23. Burin-like implement, chert             | T1, Midden 1, wall, level 1     |
| Figure 24. Burin-like implement, chert             | T1, Midden 1, square 7, level 1 |
| Figure 25. Burin-like implement, chert             | T1, Midden 1, square 7, level 2 |
| Figure 26. Burin-like implement, chert             | T1, Midden 1, square 6, level 1 |
| Figure 27. Burin-like implement, chert             | T1, Midden 3, square 5, level 1 |
| Figure 28. Burin-like implement, chert             | T1, Midden 1, square 5, level 2 |
| Figure 29. Burin-like implement, chert             | T1, Test Pit 8                  |
| Figure 30. Burin-like implement, chert             | T1, Midden 1, square 3, level 3 |
| Figure 31. Burin-like implement, chert             | T1, Midden 1, square 2, level 1 |
| Figure 32. Burin-like implement, chert             | T1, Midden 1, square 7, level 3 |
| Figure 33. Burin-like implement, chert             | T1, Midden 1, square 5, level 1 |
| Figure 34. Burin-like implement, chert             | T1, Midden 1, square 1, level 3 |
| Figure 35. Burin-like implement, chert             | T1, Midden 1, square 6, level 2 |
| Figure 36. Burin-like implement, nephrite          | T1, Midden 1, square 2, level 2 |
| Figure 37. Burin-like implement, nephrite          | T1, Midden 4, square 2, level 1 |
| Figure 38. Burin-like implement, tip, nephrite     | T1, Midden 1, square 2, level 2 |
| Figure 39. Implement tip, surfaces ground          | T1, Midden 1, square 6, level 2 |
| Figure 40. Burin, chert                            | T1, Midden 4, square 3, level 1 |
| Figure 41. Burin, chert                            | T1, Midden 1, square 2, level 1 |
| Figure 42. Burin, chert                            | T1, Surface, west               |
| Figure 43. Burin, chert                            | T1, Midden 1, square 3, level 1 |
| Figure 44. Burin, chert                            | T1, Midden 3, square 1, level 1 |
| Figure 45. Burin, chert                            | T1, Midden 4, square 3, level 1 |
| Figure 46. Burin, chert                            | T1, Midden 4, square 3, level 2 |
| Figure 47. Burin, chert                            | T1, Test Pit 6                  |
| Figure 48. Engraving tool, chert                   | T1, Midden 1, wall, level 3     |
| Figure 49. Engraving tool, chert                   | T1, Test Pit 6                  |
| Figure 50. Core, chert                             | T1, Midden 1, square 6, level 2 |
| Figure 51. Core, chert                             | T1, Midden 2, square 1, level 1 |
| Figure 52. Rubbing stone, sandstone                | T1, Midden 2, square 8, level 1 |
| Figure 53. Vessel sherd, steatite                  | T1, Midden 1, square 6, level 2 |
| Figure 54. Vessel sherd, steatite                  | T1, Midden 1, wall, level 1     |
| Figure 55. Vessel sherd, steatite                  | T1, Midden 1, square 6, level 2 |
| Figure 56. Vessel sherd, steatite                  | T1, Midden 1, square 1, level 1 |
| Figure 57. Vessel sherd, steatite                  | T1, Midden 4, square 1, level 1 |
| Figure 58. Vessel sherd, steatite                  | T1, Midden 1, square 2, level 2 |

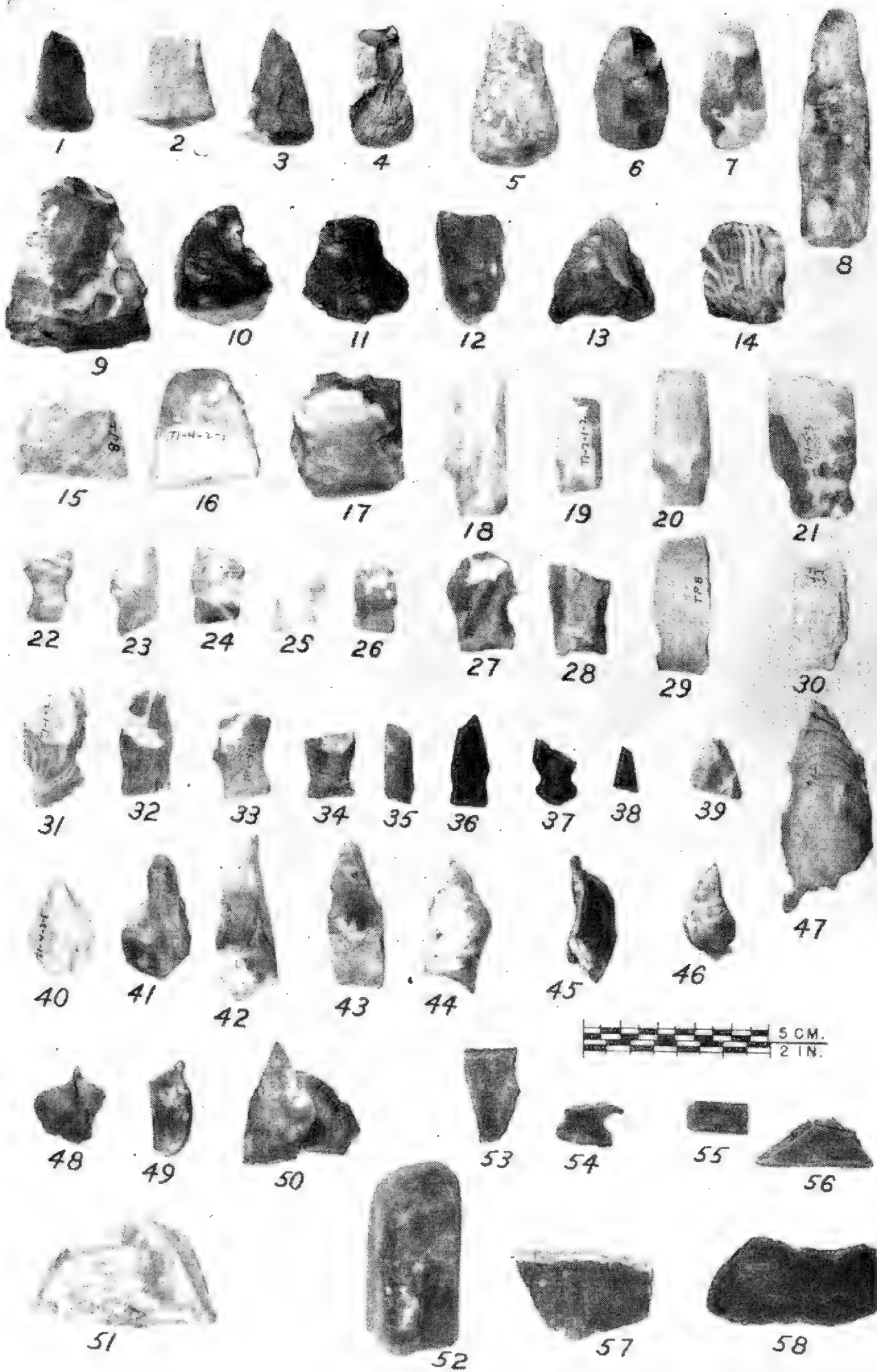


PLATE IX  
(Natural size)

Figure 1.	Lamellar flake	T1, Midden 2, square 1, level 1
Figure 2.	Lamellar flake	T1, Midden 4, square 1, level 1
Figure 3.	Lamellar flake	T1, Midden 1, square 3, level 1
Figure 4.	Lamellar flake	T1, Midden 4, square 3, level 3
Figure 5.	Lamellar flake	T1, Midden 2, square 1, level 1
Figure 6.	Lamellar flake	T1, Midden 2, square 1, level 2
Figure 7.	Lamellar flake	T1, Pond adjacent to Midden 4
Figure 8.	Lamellar flake	T1, Midden 1, square 2, level 3
Figure 9.	Lamellar flake	T1, Midden 1, square 2, level 1
Figure 10.	Lamellar flake	T1, Midden 3, square 5, level 2
Figure 11.	Lamellar flake	T1, Midden 1, square 5, level 3
Figure 12.	Lamellar flake	T1, Midden 4, square 2, level 1
Figure 13.	Lamellar flake	T1, Midden 1, square 2, level 1
Figure 14.	Lamellar flake	T1, Midden 2, square 1, level 1
Figure 15.	Lamellar flake	T1, Midden 2, square 1, level 2
Figure 16.	Lamellar flake	T1, Midden 1, square 1, level 3
Figure 17.	Lamellar flake	T1, Midden 1, square 3, level 1
Figure 18.	Lamellar flake	T1, Midden 1, square 6, level 1
Figure 19.	Lamellar flake	T1, Midden 2, square 1, level 2
Figure 20.	Lamellar flake	T1, Midden 1, square 1, level 1
Figure 21.	Lamellar flake	T1, Midden 1, square 6, level 1
Figure 22.	Lamellar flake	T1, Midden 4, square 3, level 1
Figure 23.	Lamellar flake	T1, Midden 1, wall, level 3
Figure 24.	Lamellar flake	T1, Midden 2, square 1, level 1
Figure 25.	Lamellar flake	T1, Midden 1, square 3, level 2
Figure 26.	Lamellar flake	T1, Midden 1, square 3, level 3



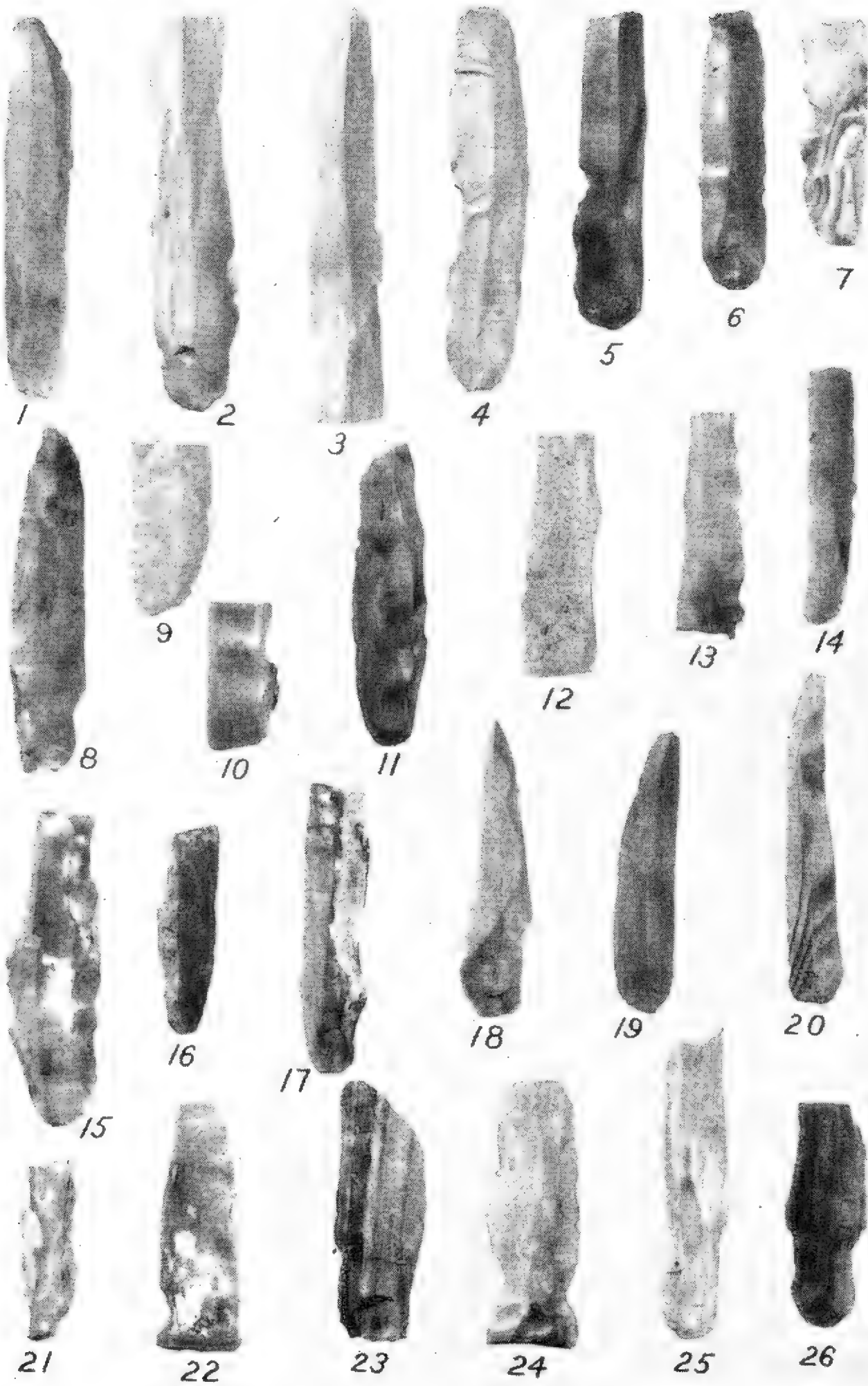


PLATE X  
(Natural size)

Figure 1. Lamellar flake	T1, Midden 2, square 5, level 2
Figure 2. Lamellar flake	T1, Midden 2, square 6, level 1
Figure 3. Lamellar flake	T1, Midden 2, square 1, level 1
Figure 4. Lamellar flake	T1, Midden 2, square 6, level 1
Figure 5. Lamellar flake	T1, Midden 2, square 3, level 2
Figure 6. Lamellar flake	T1, Midden 2, square 2, level 2
Figure 7. Lamellar flake	T1, Midden 2, square 5, level 1
Figure 8. Lamellar flake	T1, Midden 1, square 6, level 1
Figure 9. Lamellar flake	T1, Surface, north
Figure 10. Lamellar flake	T1, Midden 1, square 1, level 2
Figure 11. Lamellar flake	T1, Midden 1, square 1, level 1
Figure 12. Lamellar flake	T1, Midden 1, square 2, level 2
Figure 13. Lamellar flake	T1, Midden 1, square 2, level 3
Figure 14. Lamellar flake	T1, Midden 1, square 6, level 1
Figure 15. Lamellar flake	T1, Surface, west
Figure 16. Lamellar flake	T1, Midden 1, square 3, level 3
Figure 17. Lamellar flake	T1, Midden 1, square 2, level 2
Figure 18. Lamellar flake	T1, Midden 3, square 5, level 1
Figure 19. Lamellar flake	T1, Midden 1, square 4, level 3
Figure 20. Lamellar flake	T1, Midden 1, square 6, level 1
Figure 21. Lamellar flake	T1, Midden 1, square 4, level 2
Figure 22. Lamellar flake	T1, Midden 1, wall, level 2
Figure 23. Lamellar flake	T1, Midden 1, wall, level 3
Figure 24. Lamellar flake	T1, Midden 1, square 7, level 2
Figure 25. Lamellar flake	T1, Midden 1, square 2, level 2
Figure 26. Lamellar flake	T1, Midden 1, wall, level 1
Figure 27. Lamellar flake	T1, Midden 3, square 5, level 2
Figure 28. Lamellar flake	T1, Midden 3, square 5, level 2
Figure 29. Lamellar flake	T1, Midden 3, square 1, level 1
Figure 30. Lamellar flake	T1, Test Pit 2

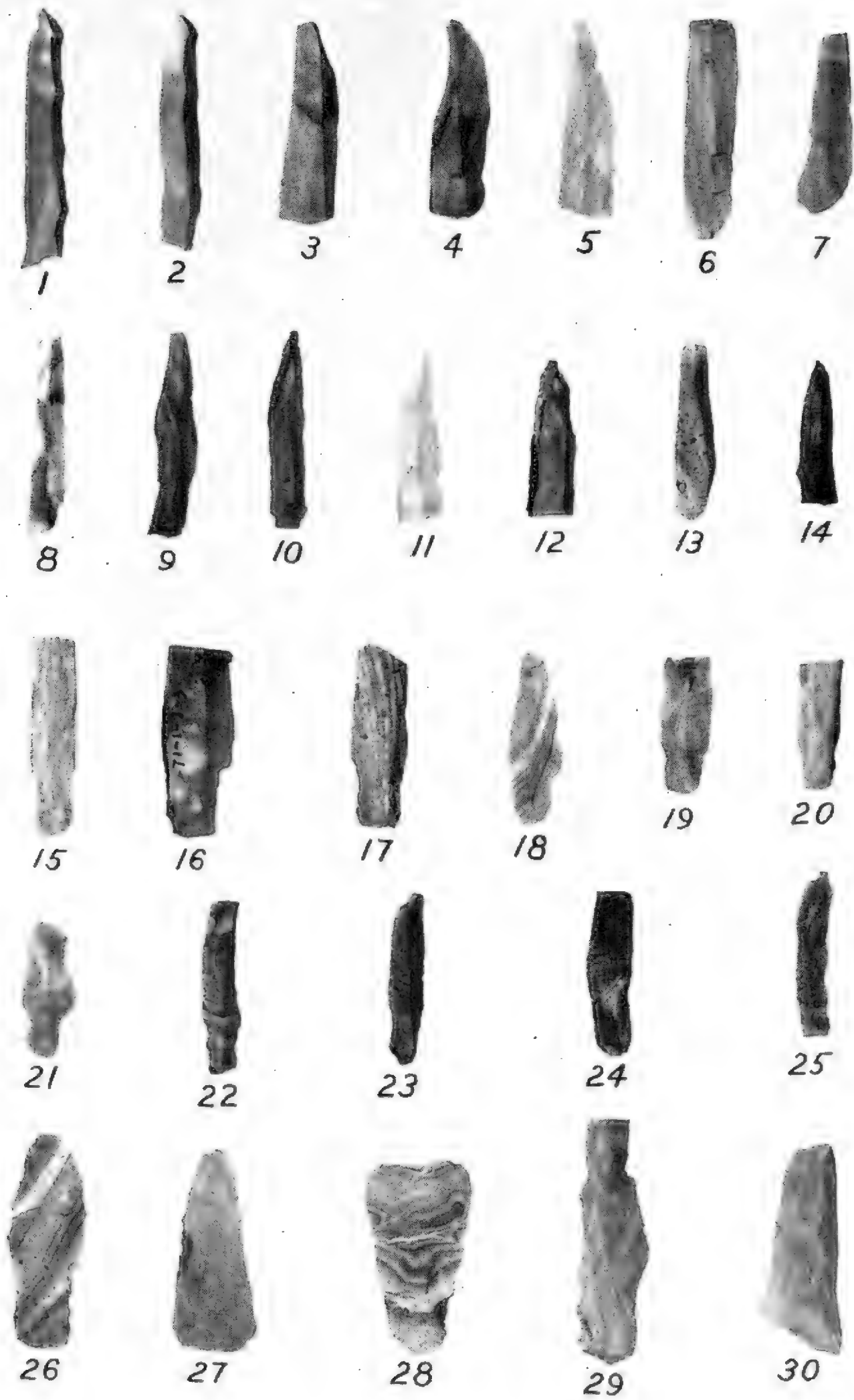
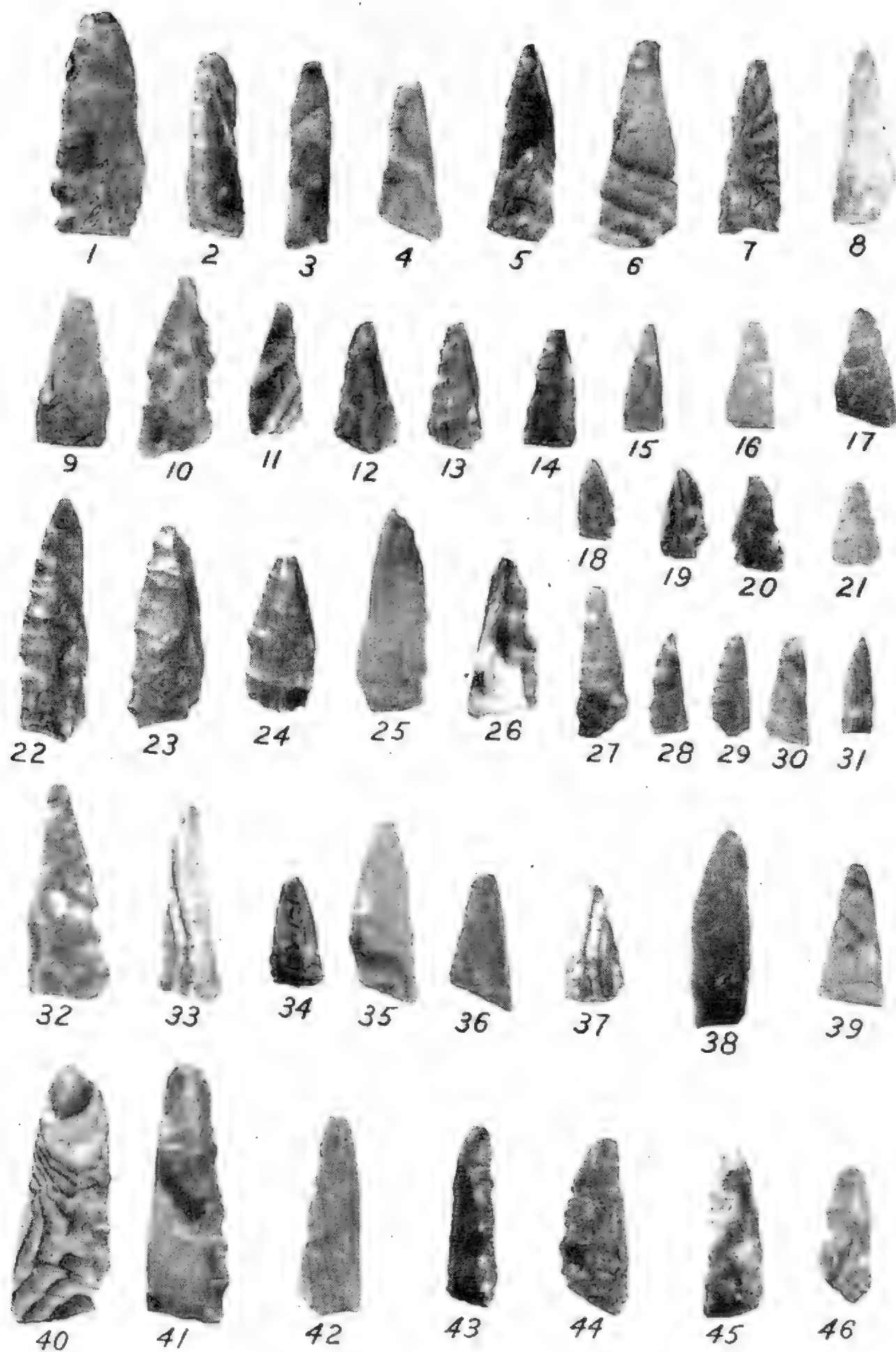


PLATE XI  
(Natural size)

Figure 1. Blade, chert	T1, Midden 4, square 2, level 2
Figure 2. Blade, chert	T1, Midden 3, square 1, level 2
Figure 3. Blade, chert	T1, Midden 1, square 7, level 3
Figure 4. Blade, chert	T1, Midden 3, square 5, level 1
Figure 5. Blade, chert	T1, Midden 1, square 1, level 1
Figure 6. Blade, chert	T1, Midden 4, square 3, level 2
Figure 7. Blade, chert	T1, Midden 1, square 2, level 2
Figure 8. Blade, chert	T1, Midden 1, wall, level 2
Figure 9. Blade, chert	T1, Midden 1, square 1, level 1
Figure 10. Blade, chert	T1, Midden 1, square 1, level 3
Figure 11. Blade, chert	T1, Midden 1, square 2, level 2
Figure 12. Blade, chert	T1, Midden 1, square 7, level 2
Figure 13. Blade, chert	T1, Midden 1, square 2, level 2
Figure 14. Blade, chert	T1, Midden 1, square 2, level 3
Figure 15. Blade, chert	T1, Midden 1, square 2, level 2
Figure 16. Blade, chert	T1, Midden 3, square 5, level 1
Figure 17. Blade, chert	T1, Midden 1, square 2, level 2
Figure 18. Blade, chert	T1, Midden 1, square 1, level 2
Figure 19. Blade, chert	T1, Midden 3, square 1, level 1
Figure 20. Blade, chert	T1, Midden 1, wall, level 1
Figure 21. Blade, chert	T1, Midden 3, square 1, level 1
Figure 22. Blade, chert	T1, Midden 1, square 2, level 3
Figure 23. Blade, chert	T1, Midden 1, square 5, level 2
Figure 24. Blade, chert	T1, Midden 1, square 7, level 3
Figure 25. Blade, chert	T1, Midden 3, square 5, level 1
Figure 26. Blade, chert	T1, Midden 1, square 2, level 3
Figure 27. Blade, chert	T1, Midden 1, square 7, level 2
Figure 28. Blade, chert	T1, Midden 1, square 6, level 1
Figure 29. Blade, chert	T1, Midden 3, square 5, level 1
Figure 30. Blade, chert	T1, Midden 3, square 1, level 2
Figure 31. Blade, chert	T1, Midden 1, square 6, level 1
Figure 32. Blade, chert	T1, Midden 1, square 1, level 1
Figure 33. Blade, chert	T1, Midden 1, square 1, level 1
Figure 34. Blade, chert	T1, Midden 3, square 1, level 1
Figure 35. Blade, chert	T1, Midden 3, square 1, level 2
Figure 36. Blade, chert	T1, Midden 1, square 5, level 2
Figure 37. Blade, chert	T1, Midden 1, wall, level 2
Figure 38. Blade, chert	T1, Midden 1, square 3, level 3
Figure 39. Blade, chert	T1, Test Pit 1, level 2
Figure 40. Blade, chert	T1, Midden 4, square 2, level 2
Figure 41. Blade, chert	T1, Midden 4, square 1, level 1
Figure 42. Blade, chert	T1, Midden 2, square 1, level 1
Figure 43. Blade, chert	T1, Midden 3, square 5, level 2
Figure 44. Blade, chert	T1, Midden 1, square 7, level 2
Figure 45. Blade, chert	T1, Midden 1, square 5, level 3
Figure 46. Blade, chert	T1, Test Pit 8

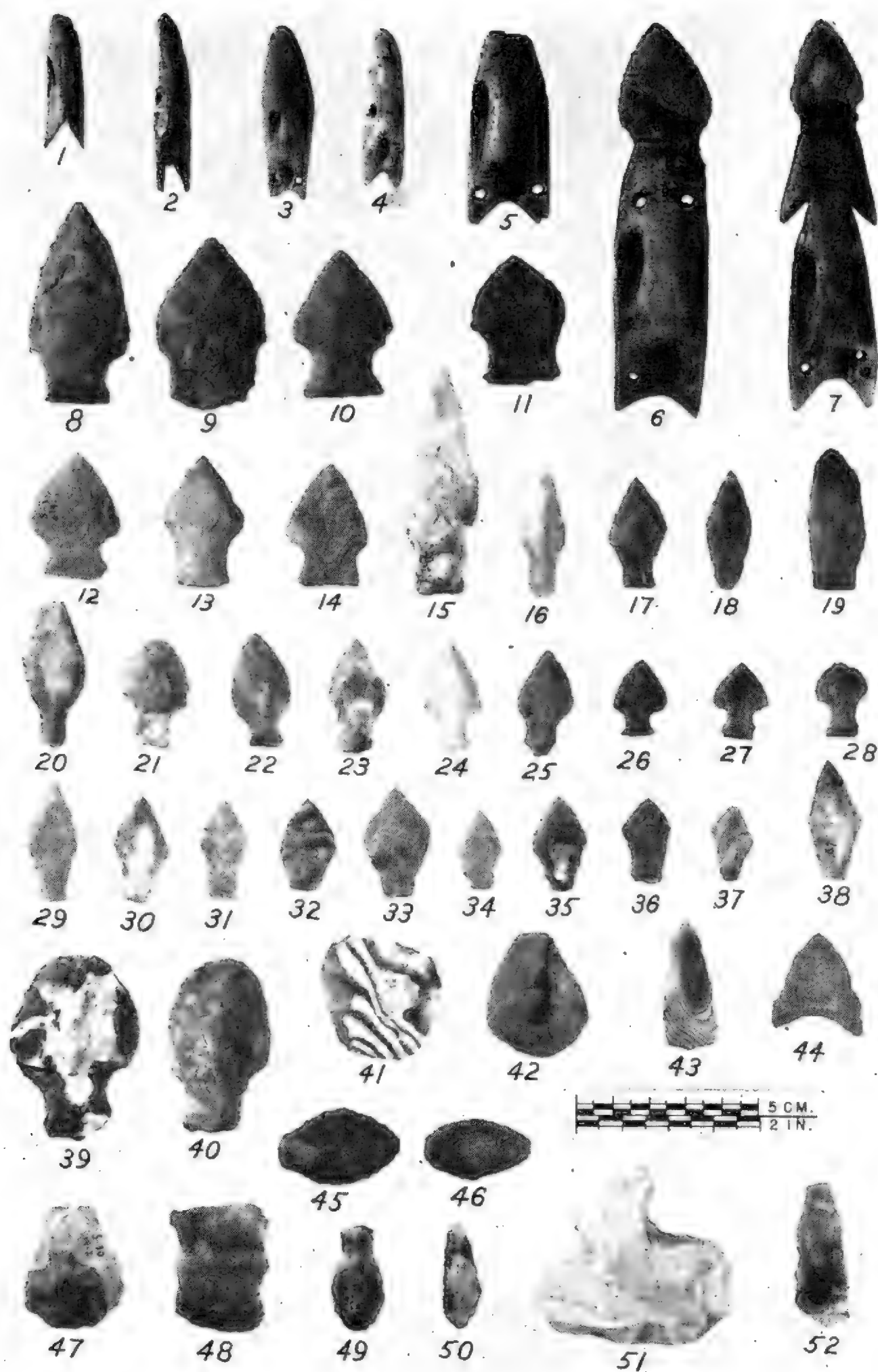


## PLATE XII

( $\frac{1}{2}$  natural size)

Figure 1.	Harpoon head, Dorset, antler	Sadlermiut, House 30, sq. 33, lev. 2
Figure 2.	Harpoon head, ivory	Sadlermiut, House 30, sq. 33, lev. 2
Figure 3.	Harpoon head, bone	Sadlermiut, House 37
Figure 4.	Harpoon head, ivory	Sadlermiut, House 30, sq. 32, lev. 2
Figure 5.	Harpoon head, bone	Sadlermiut, House 37
Figure 6.	Harpoon head, antler, and chert blade	Sadlermiut, Burial 17
Figure 7.	Harpoon head, bone, and chert blade	Sadlermiut, House 3, Coats Island
Figure 8.	Harpoon or knife blade, chert	Sadlermiut, House 30, sq. 33, lev. 2
Figure 9.	Harpoon or knife blade, chert	Sadlermiut, House 30, sq. 19, lev. 1
Figure 10.	Harpoon blade, chert	Sadlermiut, House 30, sq. 23, lev. 2
Figure 11.	Harpoon or knife blade, chert	Sadlermiut, House 30, sq. 13, lev. 2
Figure 12.	Harpoon blade, chert	Sadlermiut, House 30, sq. 19, lev. 1
Figure 13.	Harpoon blade, chert	Sadlermiut, House 30, sq. 27, lev. 1
Figure 14.	Harpoon blade, chert	Sadlermiut, House 30, sq. 28, lev. 2
Figure 15.	Knife or lance blade, chert	Sadlermiut, House 37
Figure 16.	Arrow point, chert	Sadlermiut, House 30, sq. 13, lev. 1
Figure 17.	Arrow point, chert	Sadlermiut, House 30, sq. 24, lev. 1
Figure 18.	Arrow point, chert	Sadlermiut, House 30, sq. 27, lev. 1
Figure 19.	Knife blade, chert	Sadlermiut, House 30, sq. 33, lev. 2
Figure 20.	Arrow point, chert	Sadlermiut, House 30, sq. 27, lev. 1
Figure 21.	Arrow point, chert	Sadlermiut, House 30, sq. 14, lev. 2
Figure 22.	Arrow point, chert	Sadlermiut, House 30, sq. 14, lev. 1
Figure 23.	Arrow point, chert	Sadlermiut, House 30, sq. 33, lev. 2
Figure 24.	Arrow point, chert	Sadlermiut, House 30, sq. 27, lev. 2
Figure 25.	Arrow point, chert	Sadlermiut, House 30, sq. 28, lev. 1
Figure 26.	Arrow point, chert	Sadlermiut, House 30, sq. 15, lev. 2
Figure 27.	Arrow point, chert	Sadlermiut, House 30, sq. 28, lev. 6
Figure 28.	Arrow point, chert	Sadlermiut, House 37
Figure 29.	Arrow point, chert	Sadlermiut, House 30, sq. 28, lev. 1
Figure 30.	Arrow point, chert	Sadlermiut, House 30, sq. 28, lev. 2
Figure 31.	Arrow point, chert	Sadlermiut, House 30, sq. 28, lev. 1
Figure 32.	Arrow point, chert	Sadlermiut, House 30, sq. 33, lev. 2
Figure 33.	Arrow point, chert	Sadlermiut, House 30, sq. 25, lev. 2
Figure 34.	Arrow point, chert	Sadlermiut, House 30, sq. 33, lev. 2
Figure 35.	Arrow point, chert	Sadlermiut, House 30, sq. 33, lev. 1
Figure 36.	Arrow point, chert	Sadlermiut, House 30, sq. 33, lev. 2
Figure 37.	Arrow point, chert	Sadlermiut, House 30, sq. 12, lev. 1
Figure 38.	Arrow point, chert	Sadlermiut, Burial 7
Figure 39.	Tanged scraper, chert	Sadlermiut, House 30, sq. 18, lev. 1
Figure 40.	Tanged scraper, chert	Sadlermiut, House 3, Coats Island
Figure 41.	Scraper, chert	Sadlermiut, House 37
Figure 42.	Scraper, chert	Sadlermiut, House 30, sq. 18, lev. 1
Figure 43.	Scraper (?), chert	Sadlermiut, House 30, sq. 27, lev. 2
Figure 44.	Harpoon blade, chert, Dorset	Sadlermiut, House 30, sq. 14, lev. 2
Figure 45.	Ovoid blade, chert	Sadlermiut, House 37
Figure 46.	Ovoid blade, chert	Sadlermiut, House 30, sq. 13, lev. 2
Figure 47.	Scraper, chert	Sadlermiut, House 30, sq. 19, lev. 2
Figure 48.	Scraper, chert	Sadlermiut, House 37
Figure 49.	Scraper, chert	Sadlermiut, House 30, sq. 12, lev. 1
Figure 50.	Scraper, chert	Sadlermiut, House 30, sq. 17, lev. 1
Figure 51.	Scraper, chert	Sadlermiut, House 30, sq. 33, lev. 1
Figure 52.	Scraper (?), chert	Sadlermiut, House 37





## NOTES SUR L'URBANISATION D'UNE COMMUNAUTÉ QUÉBÉCOISE

*Par Marcel Rioux*

Pendant l'été de 1951, j'ai passé quatre mois sur la rive nord des environs de Québec pour étudier les phénomènes d'urbanisation et de changement culturel qui se déroulent dans cette région; la communauté de Laval-sur-Montmorency fut choisie pour l'étude approfondie de ce genre de phénomènes. Une étude statique de la littérature orale dite folklorique de cette communauté venait de paraître<sup>1</sup> au moment où j'entrepris mon étude; cette publication m'a incité à étudier, d'un point de vue dynamique, la vie socio-culturelle de ce village. Nous ne voulons donner ici qu'un bref aperçu de notre enquête.

Le mot urbanisation est ici entendu au sens large; c'est un terme qui peut s'appliquer non seulement aux processus socio-culturels qui se manifestent à l'intérieur d'un groupement urbain mais aussi aux répercussions que les modes de vie urbains peuvent avoir sur d'autres groupes, si restreints et éloignés de la ville soient-ils. Comme le dit Louis Wirth: "Urbanization no longer denotes merely the process by which persons are attracted to a place called the city and incorporated into its system of life. It refers also to that cumulative accentuation of the characteristics distinctive of the mode of life." (Urbanisation ne signifie pas seulement le processus en vertu duquel les individus sont attirés dans un endroit appelé ville et incorporés dans son système de vie; le mot connote aussi les effets cumulatifs des caractères distinctifs de ce genre de vie.)<sup>2</sup> Nous avons donc voulu connaître comment évolue la communauté de Laval-sur-Montmorency, comment la vie de ses individus est influencée par le voisinage de la ville de Québec et comment elle résiste à cette influence.

Bien que située à vingt milles seulement de Québec, Laval n'est pas aussi urbanisée que sa proximité avec la ville le laisserait croire; même un observateur superficiel qui passerait de Québec à Laval aurait tôt fait de noter de grandes différences entre les deux milieux. Entre Beauport (banlieue de Québec) et Laval, la différence quoique moins grande, reste très sensible. On pourrait croire, en effet, que moins la distance est grande entre une communauté rurale et la ville, plus l'urbanisation de cette communauté est avancée. Il est évident que la distance physique entre le foyer d'urbanisation et les communautés qui y sont soumises est un élément important mais ce n'est pas le seul facteur en cause; entrent aussi en ligne de compte le genre de vie, l'état de la division du travail social, l'homogénéité sociale et culturelle de la communauté, son accessibilité et sa composition ethnique; tous ces facteurs influent sur le rythme de l'acculturation, l'accélèrent ou le freinent.

<sup>1</sup> Sœur Marie-Ursule, c.s.j., *Civilisation traditionnelle des Lavallois*, Les Presses Universitaires Laval, Québec, 1951.

<sup>2</sup> Wirth, Louis, *Urbanization*, The American Journal of Sociology, juillet 1938, p. 5.

La paroisse de Laval forme une communauté d'environ 1,000 habitants distribués sur un territoire d'à peu près huit milles carrés; au centre de la paroisse, le village proprement dit forme une concentration assez importante: sur les 165 feux recensés en 1951, 85 se trouvent dans le village. Cette concentration, qu'on ne trouve pas dans les milieux exclusivement agricoles, rappelle les villages de pêcheurs et favorise l'extrême sociabilité et les relations qu'on associe ordinairement avec la folk société. A Laval, il n'existe pour ainsi dire pas de division du travail social; la grande majorité des chefs de famille pratiquent l'agriculture et le travail en forêt; l'agriculture est devenue une activité d'appoint tandis que le travail en forêt représente la principale source de leurs revenus. Malgré toutes les campagnes menées en faveur de l'agriculture, l'industrie du bois, plus rémunératrice et moins aléatoire, gagne sans cesse du terrain.

Pour expliquer l'état de l'urbanisation de Laval, il faut prendre en considération le fait que la route qui vient de Québec, passe par Giffard, Beauport, Ste-Thérèse de Lisieux, s'arrête à Laval; il n'y a pas d'agglomération au delà de Laval, ce qui réduit d'autant ses contacts possibles avec l'extérieur et tend à isoler la communauté. Les Lavallois n'ont pas la visite de passants; d'autre part, depuis un certain nombre d'années, les citadins ont commencé à bâtir des chalets d'été sur la route entre Ste-Thérèse de Lisieux et Laval; un grand nombre de ces estivants fréquentent l'église de Laval et achètent des Lavallois certains produits agricoles; cette situation favorise évidemment les contacts entre ruraux et urbains et accélère la diffusion des traits urbains en milieu lavallois. Comment le problème de l'urbanisation est-il envisagé par les anthropologistes?

Robert Redfield<sup>3</sup>, après avoir étudié au Mexique les effets de l'urbanisation, conclut ainsi au sujet des différences entre le milieu paysan et la ville: "the chief of these general differences . . . are the disorganization of the culture, the secularization of the society, and the individualization of the society" (les plus importantes des différences générales . . . sont la désorganisation de la culture, la sécularisation de la société et l'individualisation de la société). Nous ne voulons discuter ici que certains aspects de ce que Redfield appelle "l'individualisation" de la société. "We may understand a society to be individualistic to the extent that the socially approved behaviour of any of its members does not involve family, clan, neighborhood, village, or other primary group." (On peut dire qu'une société est individualisée dans la mesure où un comportement individuel approuvé par la société n'engage pas la famille, le clan, le voisinage, le village ou un autre groupe primaire.)<sup>4</sup> Si, partant de cette conclusion, on se demande quel est, à Laval, le facteur principal qui a jusqu'ici freiné le processus d'urbanisation ou, à tout le moins, a atténué les effets de l'individualisation, il semble que le facteur principal soit l'existence de deux grandes familles patronymiques qui, à elles seules, forment environ les trois cinquièmes de toute la population. Il semble que le réseau de

<sup>3</sup> Redfield, Robert, *The Folk Culture of Yucatan*, Chicago, 1941.

<sup>4</sup> *Ibidem*, p. 356.

parenté dans lequel les individus baignent freine justement l'individualisation de la société. Sur les 165 feux de Laval (1951), 55 portent ou le patronyme Fortier (23) ou Thomassin (32); de plus, 49 femmes, Fortier ou Thomassin, figurent comme épouses dans autant de feux; de ces 49 femmes, 20 ont épousé des individus portant d'autres patronymes que les leurs, 14 femmes sont mariées avec des Fortier ou des Thomassin, selon qu'elles sont nées Thomassin ou Fortier; enfin 15 sont mariées avec des hommes portant le même patronyme qu'elles.

Bien qu'ayant d'abord été colonisée par des Irlandais à partir de 1830 et que sa population fût à majorité irlandaise jusqu'en 1875, Laval forme aujourd'hui une paroisse canadienne-française dans la proportion de 97 p. 100. À part les deux grandes familles dont on vient de parler et qui se sont entre-mariées depuis l'arrivée de colons de langue française à Laval, vers 1850, on trouve 37 patronymes différents dont chacun compte en moyenne trois feux.

Il semble bien que l'une des caractéristiques les plus importantes de la folk société soit le lien très puissant qui lie les individus d'une communauté et les fait participer à un réseau extrêmement serré de relations directes. L'existence de cet état de choses et ses conséquences représentent, semble-t-il, le caractère essentiel de cette forme de société, celui qui la différencie le plus de la société urbaine contemporaine; c'est le caractère positif de cette forme de société. Un des aspects les plus importants de cette caractéristique, du moins au niveau de la personnalité, c'est l'idée que les individus se font de leur moi; le moi est socialisé, c'est-à-dire qu'il est vu et défini par les individus en relation avec les autres membres de la communauté; ce sont les caractères périphériques du moi, ses coordonnées sociales qui prennent le pas sur ses caractères individuels.

La communauté de Laval, comme toute autre communauté, est marquée de temps faibles et forts; il est des périodes où les tâches sociales imparties à chacun sont accomplies dans une sorte de grisaille quotidienne; il est d'autres périodes, que Durkheim appelle les temps forts de la société, où la communauté manifeste son existence comme telle, où ses membres se donnent entièrement à la sociabilité<sup>5</sup> et rechargent leur potentiel de sociabilité. Il semble, d'autre part, qu'à mesure que les sociétés changent de forme et passent de la forme tribale à la forme urbaine, les occasions de rassemblement sont moins nombreuses et que ces temps forts durent moins longtemps. Dans les sociétés urbaines contemporaines, nous sommes loin de ces fêtes tribales qui durent pendant plusieurs semaines et même des mois. L'urbain ne sacrifie pas volontiers à la société; il retrouve vite son quant à soi; il faut voir dans l'individualisation de la société un des effets de l'urbanisation. Même les fêtes et les jours fériés ne sont pas des occasions pour recharger le potentiel de sociabilité des individus. À la différence de la fête primitive qui est une occasion, comme le dit Gusdorf, de redonner à l'existence communautaire sa pleine vigueur rituelle et qui

<sup>5</sup> Rioux, Marcel, *Sociabilité et typologie sociale* dans *Contributions aux sciences de l'homme*, n° 2, Montréal, 1954.

apparaît comme un moment de l'expansion du sacré, la fête par excellence d'un type de société comme Laval, la noce, semble être non pas tant centrée sur le sacré que sur la communauté elle-même.

Nous avons cru apercevoir dans la noce de Laval une manifestation de cet esprit de communauté qui est un des caractères distinctifs de la folk société. La noce n'est pas une occasion de s'amuser privément, par couples, mais l'occasion pour une grande partie de la communauté de se divertir ensemble. S'il est vrai que la messe du dimanche représente une occasion de rencontre, de communion sociale, là, le religieux prend le social en charge. Tout se passe comme si, dans l'attente de l'événement d'importance qu'est la messe du dimanche, les esprits se préparaient aussi à une grande consommation de sociabilité; mais la messe, cérémonie religieuse d'abord, ne donne pas satisfaction à leurs besoins de sociabilité; c'est pourquoi il y a une chute dans le tonus social après la cérémonie religieuse. Mais même la messe n'est pas entièrement dépourvue de manifestations de sociabilité: elle donne lieu à des rencontres, à des conversations qui satisfont à la sociabilité: le religieux même est baigné de social et la pratique religieuse se ressent de la socialisation de la société; à mesure qu'elle s'individualisera, le religieux aussi s'individualisera.

Pour la noce, il n'en va pas ainsi; la sociabilité prend sa revanche. Brimée le dimanche, elle se donne libre cours à la noce. La cérémonie religieuse, le mariage, est vite oubliée au profit des réjouissances qui la suivent. Plusieurs hommes ne se donnent même pas la peine d'entrer à l'église; les femmes assistent à la cérémonie religieuse en plus grand nombre; plusieurs d'entre elles qui ne prendront pas part à la noce assistent aux cérémonies religieuses. On ne décrira pas ici la noce en détail; on ne veut que faire ressortir son caractère communautaire et le rôle que les deux grandes familles de Laval jouent dans ce complexe et, partant, la part qu'elles prennent à la conservation du caractère folk de la communauté de Laval.

Nous avons assisté pendant l'été de 1951 à quatre noces: chacune avait l'importance d'un événement majeur dans la communauté. Elles donnent lieu à des préparatifs nombreux et variés et sont l'objet des conversations plusieurs jours avant qu'elles se déroulent; comme chaque famille est pour ainsi dire quelque peu apparentée à la grande majorité des individus, tout le monde est intéressé, d'une façon ou d'une autre, à la plupart des mariages. Les invitations se distribuent selon un mode complexe qui tient compte du degré de parenté avec l'un ou l'autre des conjoints. Il va sans dire que c'est la première journée de la noce qui est la plus importante et selon le degré de parenté, on peut être invité au mariage, au déjeuner, à la danse de l'après-midi, au dîner, ou à la soirée; les plus proches parents des deux côtés sont ordinairement invités pour toute la journée. C'est en qualité de "charretier" que je fus invité à ma première noce à Laval. L'ordre du défilé est minutieusement réglé par le degré de parenté des individus qui occupent les différentes automobiles: le matin,



ce sont les parents de la mariée qui passent d'abord par ordre de proximité décroissante, les parents du marié ensuite; le soir, le repas étant offert par le père du marié, l'ordre change. Au début de la noce, les chauffeurs forment un groupe assez distinct et qui se tient un peu à l'écart du gros de la noce. A ce moment de la journée, le statut de chauffeur est ambivalent; d'une part, les gens de la noce traitent avec quelque distance ces personnes qui ne sont pas de la famille; ceux des chauffeurs qui sont des parents sont considérés comme chauffeurs; d'autre part, on leur manifeste quelques égards car ils sont, en quelque sorte, des invités spéciaux qui rendent service; même lorsque quelqu'un est embauché pour une raison précise, on ne peut s'empêcher de le traiter comme si le service était rendu bénévolement; la forme communautaire d'activité tend à se superposer à la forme contractuelle. A mesure que la noce se déroule, cependant, change l'attitude des gens de la noce envers les chauffeurs; ils redeviennent des parents comme les autres ou des Lavallois ordinaires. Un chauffeur se rendit compte de ce statut quelque peu complexe: "ce soir, dit-il, ce n'est pas comme chauffeur que j'assisterai à la noce mais comme parent".

La noce, période d'effervescence, temps fort de la communauté, donne lieu à toutes sortes d'extravagances qui ne sont pas sans rappeler le potlatch des sociétés tribales. Des chefs de familles, d'habitude économes et rangés, dépensent pour la noce des sommes relativement considérables. Dans la paroisse voisine, les noces de Laval sont considérées comme des événements extraordinaires qui laissent loin derrière eux ce qui se fait ailleurs. "Des gens s'endettent pour plusieurs années à venir," m'a dit un marchand des environs. Les comportements des individus diffèrent grandement à cette occasion de leurs comportements habituels; il s'opère une espèce de mue, de transformation, qui rend souvent méconnaissables les individus rencontrés en dehors de ces fêtes; des excès de langage, de boire et de manger sont de mise. C'est un jour où les défenses et les barrières tombent.

L'importance de la noce et son caractère communautaire se reflètent dans le fait que, contrairement à ce qui se passe dans la plupart des milieux urbains et même ruraux, les Lavallois ne font généralement pas de voyage de noces. Les jours qui suivent le mariage, les mariés font visite à leur parenté, encore par ordre de proximité décroissante; à chacune de ces visites, on offre généralement un repas aux mariés et on donne une soirée en leur honneur. A toutes les manifestations qu'occasionne la noce, le rôle des vieillards et des plus vieux est considérable: ce sont eux qui donnent le ton, qui prennent en main les divertissements et qui mènent la fête. A ce sujet, j'ai noté des différences appréciables entre certaines autres "veillées" et les rassemblements de la noce. Autant le groupe marque une grande cohésion à la noce, autant on sent que c'est la fête de la parenté et de la communauté, autant, à d'autres occasions, l'entrain manque. La différence essentielle entre ces deux manifestations est la suivante: à la noce, comme nous l'avons vu, c'est la solidarité des familles, de la communauté, qui prévaut; à d'autres "veillées" c'est l'esprit urbain qui prédomine



parce qu'elles sont organisées par des jeunes gens qui travaillent en ville et qui se réunissent d'abord pour danser avec leurs amies. Le résultat est bien différent: aux veillées de forme urbaine, ce sont les affections individuelles qui donnent le ton; des couples se forment qui danseront ensemble pendant toute la soirée sans se soucier des autres; à la noce, au contraire, les couples d'amoureux qui y participent restent, pour ainsi dire, partie de la communauté et n'importe qui peut danser avec n'importe qui; c'est la parenté et la communauté qui dominent.

La noce n'est qu'une des occasions où la présence des grandes familles se fait sentir; dans la vie quotidienne, il est évident que leur influence est sensible. On s'étonnera souvent que quelqu'un habite le village s'il n'y a pas de parenté. Et il semble que ce soit justement ceux qui n'ont pas beaucoup de parenté dans la communauté, qui ne se sentent pas encadrés et soutenus par d'autres individus, qui sont les plus enclins à s'urbaniser, à adopter les attitudes et les valeurs de la ville. A Laval, nous avons étudié assez attentivement ce qui nous a semblé être le principal foyer d'urbanisation dans la communauté. Il s'agit d'une famille patronymique, la seule qui porte ce nom à Laval et qui se compose du grand-père et de sa femme, de leurs enfants mariés et célibataires et de leurs petits-enfants. Cette famille, quoique peu nombreuse, si on la compare aux grandes familles patronymiques, jouit, néanmoins, d'un certain prestige; le grand-père a longtemps été maire, marguillier et commissaire d'école. Dans sa jeunesse, il a quitté Laval pendant plusieurs années pour aller travailler aux États-Unis; il revint plus tard pour recueillir la terre paternelle en héritage. Pendant son absence, il avait acquis, semble-t-il, des idées qui ne cadraient pas avec celles de ses concitoyens. Tout en prenant une part active aux affaires de son village, il eut plusieurs démêlés qui lui valurent de nombreux procès. Il avait aussi un certain goût pour l'innovation et le changement; son désir de s'opposer à ses co-paroissiens trouvait là une autre façon de s'exprimer. S'occupant activement de politique provinciale et fédérale, il eut ainsi souvent l'occasion de rencontrer des gens de la ville; avec les années, il devint une espèce d'agent de liaison entre les citadins et les gens de son village. Dans une large mesure, toutefois, son esprit d'innovation fut tempéré et contrecarré par son épouse qui, à Laval, est bien l'une des personnes les plus traditionalistes qui soient; mais, ce qu'elle reprochait à son mari, elle l'accepte maintenant de ses enfants qui ont hérité les goûts du père et qui s'urbanisent le plus qu'ils peuvent. Cette remarque vaut surtout pour ses deux plus jeunes garçons, célibataires dans la vingtaine.

Leur habillement, leurs manières et même leur démarche se veulent urbaines; travaillant tous les deux à Québec, chaque soir ils reviennent chez leurs parents. L'un d'eux possède une voiture dernier modèle et s'en sert pour faire de l'esbroufe dans le village. A la table familiale, ils refusent catégoriquement de manger quelque mets traditionnel; il faut que tout vienne de la ville. Contrairement à bien des villageois qui sont portés sur la bière et l'alcool, eux font partie d'une société d'abstinence dont

l'origine est manifestement urbaine. Les deux frères fréquentent des jeunes filles du village qui travaillent à Québec et qui ne cachent pas, elles non plus, leur grande sympathie pour tout ce qui vient de la ville; mariées, elles ne comptent avoir que deux ou trois enfants. A la noce, ces couples ne font que de brèves apparitions et manifestent peu d'entrain pour les divertissements d'usage; ils se font plutôt les promoteurs de "veillées" urbaines.

Nous avons voulu montrer, dans ces courtes notes, que le phénomène de la parenté joue un rôle de modérateur dans l'urbanisation d'une folk communauté, que la noce est le "temps fort" de cette communauté fortement structurée autour de la parenté et que c'est surtout par une petite famille que les comportements, les attitudes et les valeurs d'origine urbaine pénètrent à Laval.

## LA PÊCHE EN GASPÉSIE

(Technologie et terminologie)

*Par Carmen Roy*

L'année 1954 nous a vue présenter au Musée national le résultat de nos enquêtes folkloriques sur *La Littérature orale en Gaspésie*. Et c'est en livrant cette monographie qui, avec ses annexes, comptait plusieurs centaines de pages, que nous avons éprouvé le désir, après en avoir saisi la nécessité, d'inventorier un nouvel aspect de l'ethnographie gaspésienne. Nous avons déjà tourné les yeux, dès 1953, vers la pêche, et particulièrement vers la pêche à la morue, pour en étudier les techniques. Une fois à l'œuvre cependant, et avec tout ce que cela implique de recherches sur tous les autres aspects du sujet à l'étude (aspects historique, démographique, économique, etc.), nous avons eu vite fait de constater que, pour rendre assimilables nos travaux sur les techniques, une étude approfondie du vocabulaire du pêcheur s'imposait d'abord. L'abondante et étonnante documentation que nous avons déjà recueillie nous y conviait, d'ailleurs, sans plus d'hésitations. Il ne s'agissait pas, bien entendu, de délaisser l'étude des techniques de pêche afin de mieux étudier la terminologie. Bien au contraire. C'est en poursuivant l'une et l'autre conjointement que nous croyons avoir élaboré un plan complet d'études, tout en adhérant à la meilleure méthode d'enquête.

Si MM. Jaberg et Jud ont, dans la préparation de leur atlas suisse-italien, réduit le rôle des questions directes en montrant les objets pour n'avoir pas à les nommer, et cela afin d'éviter la suggestion des mots, ou les calques forgés, il va de soi que, malgré ce procédé de tout temps recommandable, tout obstacle n'est pas ainsi totalement éliminé: au cours des séances de travail à domicile, dans les endroits publics, voire sous le toit même de l'enquêteur, les objets ne seront pas là et il s'agira néanmoins de les faire intervenir sans avoir à prononcer leur nom.

C'est alors qu'un questionnaire sur les techniques de la pêche permettra le jaillissement de tous ces mots inconnus qui viendront se caser dans des *phrases* pour corser ou étendre les explications. Et si la répétition d'un même mot au sujet duquel se posent des problèmes de notation phonétique peut lasser ou indisposer un informateur, dans l'éclaircissement des détails d'une technique reviendront les mêmes termes, ou leurs synonymes, sans que le sujet n'ait senti l'astuce du procédé qui pourra se reproduire presque indéfiniment, surtout si l'enquêteur sait y mettre un peu d'imagination.

On objectera peut-être ici qu'un travail aussi précis qu'est celui de la linguistique ne se mène pas à dos de cheval sur deux sujets à la fois. C'est que nous ne sommes heureusement plus au temps où il fallait noter d'un crayon trop lent mots et renseignements. Avec l'enregistrement phonographique, il n'est que de diriger la conversation, pour procéder aux recou-

pements, tout en permettant cependant à l'informateur les digressions qui lui donneront l'impression d'un moment de détente et qui nous apporteront parfois d'étonnants résultats. Et le temps de la compilation venu, rien de plus simple que de relever dans l'ordre voulu la totalité des matériaux divers ainsi recueillis.

Nous avons d'abord songé à présenter une Encyclopédie du pêcheur, illustrée de photographies et de croquis. Cela nous eût donné à coup sûr la chance de publier en une seule fois toute notre documentation sur la matière, la groupant par ordre technique dans la première partie, et par ordre alphabétique dans la seconde. Très tôt cependant, nous avons senti les cadres de ce projet restreindre la portée que nous donnions déjà à nos enquêtes.

Et nous avons immédiatement élaboré un autre plan, celui d'un glossaire (ou d'un petit dictionnaire encyclopédique), probablement combiné avec un atlas. Car le glossaire, à lui seul, ne répondrait pas encore à nos exigences, étant donné que s'impose la nécessité de joindre à certains mots leur aire de répartition géographique, et cela, même en Gaspésie, où une unité sociale et linguistique semble, au premier coup d'œil, s'être construite. D'autre part, si ces variantes sont d'un intérêt captivant pour le linguiste, elles ne suffisent pas à motiver à elles seules le concept de l'atlas. De là la nécessité de combiner. Quoi qu'il en soit, notre plan d'enquêtes reste bien défini, envers et contre les modifications qu'aura à subir la présentation.

Comme les techniques de la pêche ont ouvert la voie à nos recherches et nous ont acquis la plus large partie de notre documentation, nous souhaiterions les exposer ici en regard des différents points de vue que nous avons envisagés dans la marche de nos enquêtes. Si nous nous en abstenons, c'est non seulement parce qu'elles exigeraient l'espace dont nous ne disposons pas, mais aussi parce que nous commencerons, dès la fin de cette saison, à publier, par tranches, des études qui les présenteront sous leurs divers aspects: types de bateaux, engins de pêche requérant chacun le sujet d'une étude, l'époque et les lieux de la pêche, les techniques de la pêche à la ligne, l'évolution de la pêche moderne, etc. Par contre, nous éluciderons plutôt — parce que nous ne pourrions publier ce travail bientôt — notre plan d'enquêtes relatif au vocabulaire du pêcheur sur lequel sont actuellement conjugués nos efforts.

Lorsque notre étude exhaustive de la sémantique sera terminée, après l'avoir menée sur un plan comparatif, tant pour le Canada que pour la France, nous attaquerons, si les circonstances le permettent, l'aspect morphologique. Nous y travaillons présentement, mais nous ne consentirions pas à livrer le résultat de nos enquêtes sans l'avoir préalablement discuté avec des spécialistes en la matière. Quant à la notation phonétique, nous nous en servons chaque fois que nous ne pouvons utiliser notre appareil phonographique. Elle s'imposera cependant avec la transcription de chaque mot le jour où nous présenterons notre étude.

Nous n'avons pas pris comme base un certain nombre de mots courants pour notre questionnaire, ainsi que le firent Guilliéron et Edmont, M<sup>gr</sup> Gardette, Albert Dauzat, pour leur atlas. Nous avons relevé tous les termes de marine et de pêche de Littré, de Larousse et des glossaires que nous avons pu consulter. Ils sont sur fiches, et c'est avec eux que nous travaillons. Nous ne risquons pas ainsi de perdre certains mots qui ne sont pas d'usage courant, puisque nous sommes dirigée par les exigences mêmes de la langue française. Et de cette façon, nous pourrons mieux noter la pauvreté ou la richesse du vocabulaire du pêcheur: à chaque mot de notre vaste questionnaire correspondra une réponse, ou un blanc, ou un synonyme.

Notre questionnaire s'apparentera cependant à celui de l'atlas suisse-italien et de l'atlas linguistique du Lyonnais, non seulement en faisant place à l'ethnographie à côté de la linguistique, mais:

1° par son désir d'établir "le vrai vocabulaire" des pêcheurs gaspésiens.

2° par ses légendes, bien que nous ne présenterons pas ces dernières par le truchement des cartes. Le sens, le geste ou la coutume évoqués par chaque mot seront explicités au fil de la présentation alphabétique des termes.

3° par ses croquis. Nous ne préparons cependant des dessins que pour les seuls cas où la photographie ne répond pas fidèlement à nos exigences, par exemple, pour certains détails relevant des techniques ou de la biologie marine. Ces illustrations prendront une grande importance, car la seule description littéraire de certains objets ne peut les rendre parfaitement, surtout lorsque ces objets, de fabrication artisanale, varient d'un endroit à l'autre.

4° par ses sigles. Nous les utiliserons en regard de la distribution géographique d'un même mot et de ses synonymes, et aussi d'un terme se prêtant à différents genres, tels "houle", "prime", "bellée", etc., que l'on emploie tantôt au féminin, tantôt au masculin, selon les secteurs.

Ils nous serviront ailleurs encore, puisque nous travaillons également sur des graphiques et des cartes présentant:

a) la courbe marquant les phénomènes d'évolution ou de régression de la pêche en Gaspésie. Dès la première année de nos enquêtes, nous avons relevé le nombre de barques pêcheuses et celui des pêcheurs évoluant le long du littoral, tout en classant ensemble ceux qui étaient "maître de barge", co-propriétaires d'une même barque, ou "pocheurs". Comme nous avons noté, dans chaque cas, le nom de l'individu, lequel apparaît sur d'immenses cartes propres à chaque village, rien ne sera plus simple que de suivre, au cours des prochaines années, la courbe démographique de cette évolution. Nous considérons ces statistiques comme un complément indispensable à l'étude de l'évolution d'un vocabulaire.

b) des statistiques révélant l'influence des termes de marine et de pêche sur le vocabulaire des éléments de la population gaspésienne qui s'intègrent à une autre unité linguistique, et vice versa.

c) le pointage rigoureux des anglicismes, archaïsmes, barbarismes, néologismes, par rapport aux mots français fournis par le vocabulaire courant du pêcheur gaspésien.

Les archaïsmes, par exemple, émaillent à un tel point le langage du gaspésien que nous pouvons nous demander, si, dans notre pointage, ils ne brimeront pas l'apport du français moderne. Voici quelques exemples courants recueillis en Gaspésie:

Lorsque les pêcheurs ont *souleur* en mer et s'empressent, malgré la *mouvée* qui passe, de *revirer* pour *nager* au *plain*, ils trouveront souvent leur grappin "enrapé", "enroché" ou *rêné*. Ils reviendront couverts de "salange", enlèveront leur *devantot*, et attendront le *parement de temps* dans leur *chafaud*. (Rabelais ne parlait pas autrement au XVI<sup>e</sup> siècle, en disant, par exemple, que le ciel commençait à *s'esparer*.) Mais si, à la *relevée*, il se fait un *clairon* dans le ciel, ils saisiront leur *broc* — qui a cinq *bro'* — et iront ramasser les coques — jamais de *mouscles* — dont ils se serviront pour bouetter, le lendemain. Encore faudra-t-il que la mer soit à la *fine basse*; si elle est étale, ils *vornousseront* en attendant, tout en surveillant leur *rets neuve* menacée de se déchirer sur les *cailles*; avant de rentrer, ils iront dire un mot aux *graviers* occupés à *virer* la morue sur les *vigneaux*.

Il faut préciser que si le relevé que nous ferons de ces archaïsmes doit prendre des proportions aussi importantes, c'est que nous aurons tenu compte tout autant de leur aspect phonétique que morphologique.

C'est d'ailleurs avec ce bel héritage vivant que M. Hector Carbonneau nous captive en nous faisant connaître des mots savoureux: *mountain*, *aigail* ou *éloise*, et leur prononciation: nasalisation des voyelles dans *gangne*, *meinnage*, etc.; diphtongue archaïque "ai ou ay, ei ou ey, au lieu de oy ou i, restée dans *nettéier* ou *netteyer* (nettoyer), *néier* ou *neyer* (noyer), *pléier* ou *pleyer* (plier), *brayer* ou *breyer* (broyer)", etc. — C'était, comme le dit l'auteur, la prononciation de la cour au XVII<sup>e</sup> siècle.

Et lorsque M. Carbonneau nous parle des noms en *al* qui, au XI<sup>e</sup> siècle, forment leur pluriel en *als*, nous pensons déjà au plaisir que nous éprouverons à citer certains secteurs de la Gaspésie où l'on dit encore: un *chevau*, des *chevals*!

Quant au pronon *je* accompagnant le verbe à la première personne du pluriel, il circule encore en Gaspésie, ce qui ne devrait cependant surprendre personne. Pourquoi s'étonner d'entendre un pêcheur nous dire: "J'avions pas d'argent, mais j'avions des prêtres dans ma famille", alors que François I<sup>er</sup> lui-même<sup>1</sup> (ce qui n'est pas si loin de nous), parlant au

<sup>1</sup> Cité par M. Hector Carbonneau.



connétable de Montmorency, s'exprimait ainsi: "J'avons espérance qu'y fera demain beau temps, veu ce que disent les étoiles, que j'avons eu très bon loysir de voir"?

Mais à côté de cette fidèle conservation des archaïsmes, apparaissent, comme l'on peut s'y attendre, les barbarismes. Mais les barbarismes — barbarismes de mots, du moins — que nous avons relevés en Gaspésie deviennent presque des "élégances" (comme le disait un jour M. Chapelain<sup>1</sup> au sujet de certains solécismes), tant leur candeur leur confère un caractère de fraîcheur.

Citons, par exemple, les mots *bordé* (pour bordage), *galféter* (pour calfater), *écupette* (pour équipet), *morin* (pour orin), *robin* (pour raban), *vraïlle* (pour vaigre), *lussa* (pour lousseau), *troussian* (pour trusquin), *placotage* (pour clapotage), etc.

Ce qui nous a le plus frappée jusqu'à présent dans la collection de ces barbarismes, c'est le brassage si uniforme de ces erreurs! Pourquoi chaque comté n'a-t-il pas déformé ces mots à sa façon! Tous les pêcheurs vous parleront du *lussa*, du *morin*, de la *vraïlle*, etc., sans connaître à ce mot ni synonyme ni variante.

Ce phénomène étrange nous a d'autant plus intriguée qu'il s'inverse lorsqu'il s'agit d'une grande partie des néologismes. Lorsqu'il a fallu trouver un mot pour désigner ces petites étoqueroresses qui relient la ralingue d'un filet aux mailles elles-mêmes, chaque secteur de la Gaspésie y est allé de son propre choix, exprimé de dix façons différentes, dans les mots: *suspente*, *maître-brin*, *montant*, *épelle*, *suspens*, *pendant*, *hauban*, *pendure*, *ganse*, *centaine*. Et la distribution géographique de ces mots est tellement bien déterminée qu'en entendre un seul nous permet, sans plus de renseignements, d'identifier la paroisse natale de l'individu qui le nomme. S'il s'agit particulièrement de l'Anse-aux-Gascons, dont les hommes vont souvent pêcher à Grande-Rivière ou à l'Anse-à-Beaufils, — rien de plus simple, puisque ce village (et ses environs) est le seul à employer le mot *hauban* dans ce sens, tout comme le fait l'Anse-au-Griffon avec *épelle*.

Le même phénomène se produit avec les mots *magonne*, *frâsil*, *lâllée*, *gâchis*, qui désignent un mélange de glace et d'eau se formant à la surface de la vague qui vient mourir sur la rive.

Il ne faudrait cependant pas croire, par ce que nous venons de dire, que les néologismes ont été ainsi créés *ex nihilo* en Gaspésie, et à tous propos. Ceux que nous avons ci-haut mentionnés ne le prouvent nullement d'ailleurs, puisque les uns connaissaient déjà un autre sens et que les autres n'ont été que relevés et non étudiés; pas plus que *barbillats* employé pour breuilles ou brouilles et désignant les entrailles, les intestins du poisson. L'étymologie de ces deux derniers mots: *burbalia*, nous intrigue sans doute un peu de prime abord, ce qui ne suffit pas à motiver des conclusions. Non moins passionnants à l'étude philologique seront les mots: *assisa* (pour siège, banc), *piotta* (pour petite barque d'une construction différente de

<sup>1</sup> Cité par Vaugelas.

celle du "flat", de la "barge" et de la "chaloupe"), *piaule* (pour banc de poissons de passage), *gripette* (pour plomb garni d'hameçons et servant à capturer l'encornet), *bouérope* (pour balise ou bourset), *pinou* (pour cale faite de trois petites cales), *pocheur* (pour lotier), etc.

En marge de ces derniers néologismes représentés par des mots qui nous semblent à priori nouveaux apparaîtront les mots déjà employés mais auxquels on attribue un autre sens, tels: *poilu* (pour plomb garni d'hameçons servant à capturer l'encornet), *rompis*, pour banc de sable (l'été), banc de *magonne* ou de *frâsil* (l'hiver), *fraîchin* (pour fraîche), *saignée* (pour remeil), *frisons* (pour paumelles), *pointer* (pour poindre), *revenir bourreau* (pour venir à retour), etc.

Ces catégories établies, il restera à déterminer dans quelle mesure un mot appartiendra à la première catégorie des néologismes (mots nouveaux), à la deuxième (mots déjà employés), à la troisième (changement de catégorie grammaticale), ou encore, devra retourner aux archaïsmes. Prenons l'exemple de *ventrèche* (pour flanchet) qu'on ne trouve, bien entendu, ni dans Littré ni dans Larousse. Un mot nouveau? non. Un mot français employé dans un autre sens? Là sera le point névralgique à éclairer dans les nombreux cas qui se présenteront. Si *ventrèche* fait partie du dialecte de l'Anjou, il ne s'apparente ni au français académique, ni au canadianisme. Il désigne, en France, la bavette de l'aloyau.

Au regard du français moderne (disons plutôt du français de M. Littré), notre relevé compte déjà une liste de plus de huit cents termes de marine et de pêche dont voici quelques exemples (pris au sens technique): *arriver*, *baquet*, *barbeyer*, *battant*, *boïard*, *brayer*, *brumé*, *caret*, *chatte*, *clin*, *dame*, *décaper*, *décoller* (couper la tête d'une morue), *dégrader*, *dépaler*, *drache*, *draquer*, *drosser*, *écore*, *écubier*, *étal*, *façon* (faire les façons), *faséier*, *ferler*, *foissière*, *fouine*, *gabord*, *guignes*, *guipon*, *haussière*, *jarlot*, *javelle*, *lisse*, *lof*, *mariage*, *mouton*, *pelan*, *picois*, *pitaut*, *pointure*, *paumelle*, *poudrin*, *raban*, *rache*, *ralingue*, *râteau*, *rave*, *retour* (prendre le retour), *revolin*, *rider*, *roque*, *rouleur*, *sabot*, *semelle*, *servir*, *talon*, *tan*, *tangon*, *tillac*, *virole*, etc.

Rien d'étonnant toutefois à ce que le pêcheur ait conservé le terme technique français, alors qu'il s'est affranchi de tant de mots — plus simples et plus courants — exprimant des idées n'intéressant pas son métier et qui, dès lors, ne le touchaient pas. En matière de pêche, il a conservé le concept qui a donné naissance au mot, et ce dernier a survécu! C'est aussi pourquoi nous pouvons remarquer que la généralité des néologismes qu'il a créés comblent une carence: soit que les ancêtres, ignorant l'hiver canadien, n'aient pu apporter un vocabulaire approprié au pays (souvenons-nous de *magonne*, *frâsil*, etc.), soit que certains termes ne fussent pas encore en usage en France lors de la découverte du nouveau monde.

A tous ces problèmes, de nombreuses conclusions s'imposent. Nous nous sommes gardés de les exposer ici, — elles seraient prématurées, — d'autant plus que cet exposé se borne à présenter le sujet de notre étude, en faisant ressortir ses multiples points d'intérêt.

# STUDIES ON THE SHORE CRUSTACEA COLLECTED IN EASTERN NOVA SCOTIA AND NEWFOUNDLAND, 1954

By E. L. Bousfield

During the period June 18 to August 20, 1954, a preliminary survey of the larger shore invertebrates of eastern Nova Scotia and Newfoundland was carried out. The survey is part of a general program, commenced in 1950, to study the distribution and intertidal ecology of the Canadian Atlantic shore fauna (Bousfield 1952, 1954, 1955a). Approximately 180 lots containing 10,000 specimens were collected, chiefly by dip net and hand picking, from the shores of more than one hundred localities along the open sea and in estuaries, rivers, streams, and lakes (Figure 1). The material has been sorted into major systematic groups in preparation for further study. The present report treats the crustacean fauna comprising sixty-five species, of which three (*Mysis gaspensis*, *Gammarus lawrencianus*, and *Asellus* sp.) are recently new to science, two (*Marinogammarus stoerensis* and *Orchestia gammarella*) are new to North America, three (*Amphiporeia virginiana*, *Marinogammarus obtusatus*, and *Caprella acutifrons*) are new to Canada, and sixteen (*Mysis stenolepis*, *Neomysis americana*, *Leptocuma minor*, *Idothea baltica*, *I. phosphorea*, *Gammarus setosus*, *G. duebeni*, *G. lacustris*, *Dexamine thea*, *Orchestia platensis*, *O. grillus*, *Talorchestia megalophthalma*, *T. longicornis*, *Hyale nilssoni*, *Corophium bonelli*, and *Cancer borealis*) are distributionally extended to Newfoundland.

The author is grateful to Mr. Norman Coates, St. John's, Newfoundland, who capably assisted in the field from August 3rd to 16th, and to the Atlantic Biological Station, St. Andrews, N.B., for providing hydrographical instruments used in the work.

## STATIONS VISITED IN NOVA SCOTIA AND NEWFOUNDLAND

Keys to station numbers:

NOVA SCOTIA  
S—Scotian mainland  
C—Cape Breton Island

NEWFOUNDLAND  
W—western Newfoundland  
N—north coast  
A—Avalon peninsula  
B—Burin peninsula

\*Observations only; no biological collections made.

Sta. No.	Date	Locality	Habitat	Water temp.	Water sal'y.
				°C.	‰
S1	June 18	Malagash Pt., Cumberland Co.	Sand and pebble shore; LW-HW levels	—	—
S2	" 20	Green B., Lunenburg Co.	Sand, pebble, and rock beaches; LW-HW levels	—	—
S3	" 21	Lawrencetown, Halifax Co.	Sand beach at HW line..	—	—

STATIONS VISITED IN NOVA SCOTIA AND NEWFOUNDLAND—*Cont.*

Sta. No.	Date		Locality	Habitat	Water temp.	Water sal'y.
					°C.	‰
S4	June	21	Clam Harbour, Halifax Co.	Sand beach at HW line..	—	—
S5	"	21	West of Moosehead, Halifax Co.	Stone and boulder beach HW-mid-tide level	—	—
C1	"	30	Janvrin I., Richmond Co.	Outer shore, stone and boulder beach	16.0	30.4
C2	"	30	Janvrin I., inner lagoon.	Sand and mud shore; pilings; HW-LW levels	—	—
C3	"	29	Poulamond Wharf, Richmond Co.	Mud and shingle flats; eel grass; LW level	17.4	30.6
*C4	"	29	Rocky B., Janvrin I.....	Stones and coarse sand; HW line	—	—
*C5	July	1	St. Peter's, Richmond Co.	Shore of Bras d'Or Lake.	—	—
*C6	"	1	Michaud Pt., Richmond Co.	Sandy beach; HW line..	—	—
*C7	"	1	Grand R., Richmond Co.	Bridge abutments (FW).	—	—
C8	"	1	3 mi. west of Fourchu, Richmond Co.	Mud flats at LW level, eel grass	—	—
C9	"	1	Fourchu Hbr., Richmond Co.	Mud flats at MW level..	—	—
C10	"	5	Black Rock Pt., Louisburg	Rocky shore; HW-LW levels	9.5	30.8
C11	"	5	Head of Mira B., SW shore; Cape Breton Co.	Pebble flats in lagoon; outer boulder beach	17.4	14.2
C12	"	3	False B., head of Morien B., Cape Breton Co.	Black muck and eel grass; under bridge	—	—
C13	"	3	Morien B., 2 mi. above Port Morien	Sand and gravel bar; HW line	—	—
C14	"	3	Morien B., N. shore, 3 mi. NE of Port Morien	Sandstone and gravel shore; LW-HW levels	12.7	30.5
*C15	"	3	Glace B., H'w'y bridge at head of bay	Exposed shingle beach..	—	—
C16	"	2	Lingan, N.S., old road bridge at Indian B.	Sand and stone bottom; HW-LW levels	19.4	29.5
*C17	June	22	East B., near Big Pond, Bras d'Or L.	Stony shore.....	—	—
C18	July	7	Sydney R., 3 mi. above mouth	Stony shoreline.....	—	—
C19	"	7	Leitch Creek, Sydney Hbr., West Arm	Sand and gravel spit; HW line	—	—
*C20	"	6	Florence, Cape Breton Co.	Sand and conglomerate rock	—	—
C21	"	6	Little Bras d'Or, at mouth, Cape Breton Co.	Outer sandstone shore, tidal zone; inner sandy mud flats	—	—
C22	June	23	Near Rocky B., Victoria Co.	Boulder beach; HW-LW.	—	—
C23	"	23	Blackbrook Cove, Victoria Co.	Sandy beach; mid-tide level	—	—
*C24	"	24	Dingwall, Victoria Co...	Sandy shore at harbour mouth	—	—
C25	"	24	North Aspy R., junction with Gray Glen Brook	Stones and riffles; sandy pools	19.4	—
C26	"	24	North Pond, near head; Victoria Co.	Shingle and mud shore, eel grass; HW-LW levels	20.3	19.6

STATIONS VISITED IN NOVA SCOTIA AND NEWFOUNDLAND—*Cont.*

Sta. No.	Date	Locality	Habitat	Water temp.	Water sal'y.
				°C.	‰
C27	June 23	NE. shore of North Pond, Victoria Co.	Sandy beach; HW-LW lines	13.3	30.4
C28	" 25	Deadman's Cove, Bay St. Lawrence	Stony beach at mouth; mud flats near head; LW	14.5	29.6
C29	" 25	Salmon R., 1 mi. west of Deadman's Cove	Stony riffles (FW).....	17.2	—
*C30	" 26	Corner Brook, Inverness Co.	Gravel and sand beach; HW line	—	—
C31	" 26	Head of Cheticamp Inlet; Inverness Co.	Stony shore; LW level mud flats, eel grass; salt marsh	18.5 >18.5	28.7 <28.7
C32	" 27	Mouth of Margaree Hbr., Inverness Co.	Sandy beach, sandstone outcrops	18.5	—
C33	" 27	Mabou Inlet, east side; Inverness Co.	Mud, stones, eel grass; HW-LW levels	23.8	18.0
C34	" 27	Port Hood, Inverness Co.	Sand and pebbles; HW line	—	—

## NEWFOUNDLAND

W1	Aug. 20	Lagoon 3 mi. S. of Cape Ray	Sandy mud flats, eel grass and salt marsh, outer sandy beach; HW	c. 16°	—
W2	July 16	Flat Bay Brook, at mouth	Sandy mud and eel grass, LW level	c. 20°	var.
W3	" 16	Flat B., Shallop Cove...	Pebble beach, eel grass at LW level	18.2	25.5
W4	" 16	St. George, at wharf....	Old wharf pilings recently pulled ashore	—	—
W5	" 11	Main R. estuary, head of St. George's B.	Outer sandy beach; HW tidal flats at RR bridge	17.5	23.2
W6	" 17	Romaines Brook, 3 mi. E. of Port-au-Port	Gravel riffles, pools.....	16.0	—
W7	" 13	Port-au-Port, N. side of isth.	Limestone and boulder beach; HW-LW	13.0	31.4
W8	" 18	Campell's Creek Cove, Port-au-Port pen.	Limestone and pebble beach	12.4	30.3
W9	" 14	Black Duck Brook, Port-au-Port pen.	Sand and stone beach, near point	17.5	30.4
W10	" 15	West B., Piccadilly.....	Outer beach; sand, stones, shells; HW-LW Estuary; mud flats, marsh	15.6	31.0
*W11	" 15	Boswarlos, Port-au-Port pen.	Black sand and pebble beach	—	—
W12	" 17	Two Gut Cove, Port-au-Port B.	Inside barrier bar; coarse sand, stones, mud; HW-LW	17.0	29.2
*W13	" 17	Fox Island R., Port-au-Port B.	Mud banks (FW).....	—	—
W14	" 11	Small L. below Pinchgut L., Harry's R.	Shore; marl and wood detritus	19.0	—
W15	" 10	Benoit's Cove, Humber estuary	Sharp pebble and gravel shore	20.5 (FW)	—

STATIONS VISITED IN NOVA SCOTIA AND NEWFOUNDLAND—*Cont.*

Sta. No.	Date	Locality	Habitat	Water temp.	Water sal'y.
				°C.	‰
W16	July 10	Cook's Brook, 3 mi. W. of Curling	Main stream, stony bottom; trib. brooklet, rocky	(warm) 12.1	—
*W17	" 19	Deer L.; NFPA bathing beach near south end	Stones and coarse sand along shore	17.9	—
W18	" 19, 20	Three Ton L., 6 mi. above Lomond	Sandy mud and stone bottom along shore	—	—
W19	" 19	Glenburnie, head of Bonne B.	Pebble and dark sand bottom; HW-LW Gravel tidal flats, stream	13.3 18.3	30.4 (brackish)
W20	" 20	Skinner Cove Brook, at road bridge	Stones, rapids; also bog ponds	15.2	—
W21	" 20	Trout R. ....	Outer rocky shore and dark sand beach	13.9	30.4
N1	" 20	Hampton; head of White B.	Sand and gravel flats at stream mouth	16.3	(brackish)
*N2	" 20	Sandy L., north end. . .	Sandy shore; under logs, etc.	—	—
N3	" 21	Little B., 10 mi. N. of Springdale	Gravel beach and stones; HW-mid-tide level	13.0	—
N4	" 21	Exploits estuary; bay north of Botwood	Gravelly sand bar; HW line	(warm)	(brackish)
N5	" 21	Exploits estuary; Philip's head	Coarse sand and stones; under Fucus; HW-LW levels	16.9	22.6
*N6	Aug. 10	Bonavista. ....	Pebble beach, N. end of town	(cold)	—
N7	" 10	Elliston. ....	Sand beach east of town (intertidal)	(cold)	—
*A1	July 24	Tickle Bay bar, Avalon isth.	Gravel and stony bay-head bar; HW line	—	—
A2	Aug. 14	Placentia; SE. estuary. .	Inside bar; shallow water, mud and eel grass	21.3	29.1
A3	" 14	Head of SE. estuary. . .	Stony shore line. ....	—	—
A4	" 14	Great Barrisway. ....	Stone and boulder bar at mouth of stream; HW-LW	14.5	30.9
A5	" 15	Salmonier estuary; above Murphy's R.	Stony shore; mud and eel grass flats	18.3	12.5
A6	" 15	St. Vincent's, Holyrood B.	Stony bar at mouth of Holyrood Pond	—	—
A7	July 30	St. Shott's, west of Cape Pine	Rock, boulders, and dark sand beach; HW-LW	11.7	27.7
A8	" 30	Bog pond; head of St. Shott's R. watershed	Stones and detritus; shallow shores	—	—
A9	" 30	Across the harbour from Trepassey	Gravel and sand cusp; HW	—	—
A10	" 30	Trepassey, head of Mutton B.	Black sand bar; HW line	—	—
A11	" 31	Biscay Bay pond. ....	Outer sand beach; LW level Mud and eel grass pond, above road bridge	— 17.0	— 10.6
A12	Aug. 1	Clam Pond, 4 mi. above Portugal Cove South	Stones and detritus, along shore, shallow water	15.8	—



STATIONS VISITED IN NOVA SCOTIA AND NEWFOUNDLAND—*Conc.*

Sta. No.	Date	Locality	Habitat	Water temp.	Water sal'y.
				°C.	‰
*A13	Aug. 1	Burnt Point Cove (Cap- pahayden)	Gravel beach; HW line..	—	—
A14	July 29	Ferryland.....	Boulder beach; LW level	13.5	30.8
A15	" 26	Witless Bay (near head).	Boulder beach; LW level	12.2	31.0
A16	" 25	Cape Fear, inner cove...	gravel bar; HW level Tidal pools, rocky shore; HW-LW levels	10.6	31.4
*A17	" 27	Signal Hill Pond, St. John's	Mud and grassy shores..	—	—
*A18	" 28	St. Phillip's, Conception B.	Pebble bar; HW line....	—	—
*A19	" 28	Topsail, Conception B...	Coarse gravel bar; HW line	—	—
A20	" 28	Long Pond, SW. of Top- sail	Boulders and gravel; HW-LW	14.8	29.9
A21	Aug. 16	Bryant's Cove, Concep- tion B.	Rock and boulders; LW level	11.6	31.2
A22	" 16	Salmon Cove, Concep- tion B.	Black sand beach at HW	—	—
*B1	" 4	Swift Current, Placentia B.	Stones at LW level.....	—	—
*B2	" 6	Frenchman's Cove, For- tune B.	Gravel and dark sand; HW	—	—
B3	" 9	Grand Beach, Fortune B.	Inside bar; shingle beach, mud and eel grass flats	17.4	29.1
B4	" 7	2 mi. N. of Fortune.....	Rock and gravel; HW- LW	14.8	30.6
*B5	" 7	Near Pt. Crewe, outer coast	Rock and gravel; HW level	—	—
*B6	" 7	Pt. May, outer coast....	Coarse black sand; HW line	—	—
*B7	" 7	Lamaline, causeway to Allan's I.	Pebble beach at LW....	—	—
B8	" 8	Lord's Cove.....	Stony beach; HW-LW levels	13.4	31.2
B9	" 8	2 mi. E. of Lord's Cove..	Black sand at HW level.	—	—
B10	" 6	Burin Bay Arm.....	Gravel and sandy mud flats; HW-LW levels	16.7	14.5
B11	" 5	Fox Cove, south side....	Narrow boulder beach; HW-LW	14.4	30.4
*B12	" 5	Salt Pond; head Burin B.	Brackish stony channel below salt pond	—	—
B13	" 5	Head of Mortier B. at highway	Stones, mud, and eel grass; HW-LW levels	17.6	16.2
*B14	" 9	Mortier Bay near Spanish Room	Fine gravel bar; HW line	—	—
*B15	" 4	Red Harbour.....	Sand and gravel bar at creek mouth	—	—

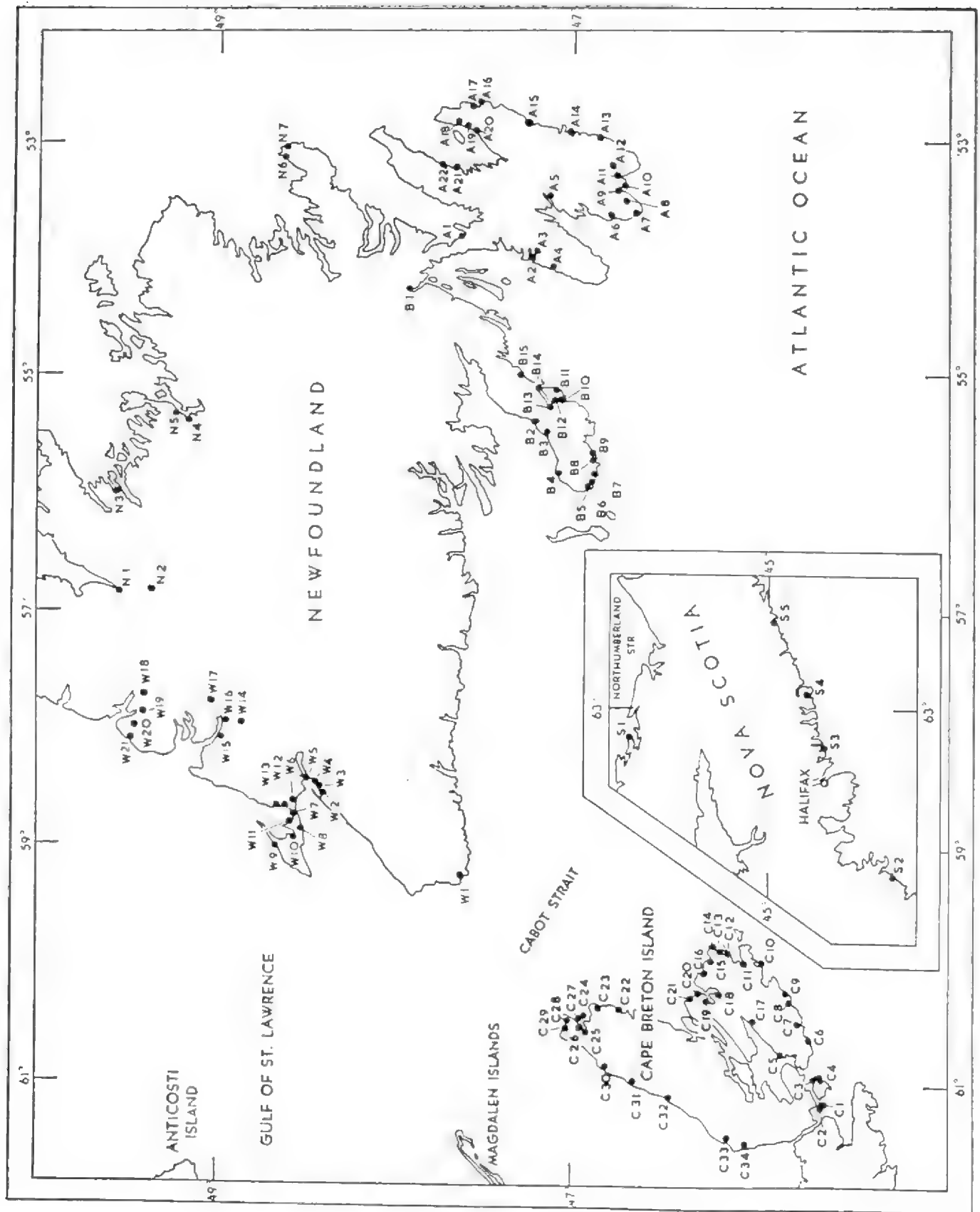


Figure 1. Collecting localities in Newfoundland and eastern Nova Scotia.

## SYNOPSIS OF THE SPECIES

Class **Cirripedia**

Order THORACICA

Sub-Order LEPADOMORPHA

1. **Lepas anatifera** L. 1758

Three dried specimens of this species, attached to a piece of driftwood lying on the sand near the HW line, were found at station B9, east of Lord's Cove, Burin peninsula. Newfoundland.

A tropical epi-biotic pelagic species, cosmopolitan in warmer seas. Previously recorded from the coasts of Nova Scotia, New Brunswick, and the Magdalen Islands (Pilsbry, 1907; Bousfield, 1954).

Sub-Order BALANOMORPHA

2. **Balanus balanoides** (L.) 1758

Fifteen specimens were collected at stations C8, 31; W1, 21; A5, 15, 16; B3; and observed at every station (except in estuaries) where shores were rocky. Newly attached and metamorphosed specimens were noted during June and early July.

In America the rock barnacle has been recorded from southern Baffin Island and Hudson strait (Bousfield, 1955c) south to Delaware Bay.

3. **Balanus crenatus** Bruguière, 1789

Seven specimens were taken at stations C1, 8, 16, 28; A21; B8; and observed at C19, 21, 24; A3, 5; on rocks, shells, pilings, at or below the low water (LW) line. Nearly all specimens examined were small and probably spat-of-the-year.

An arctic-boreal species; in America south to Long Island Sound.

4. **Balanus balanus** (L.) 1758

One specimen was collected at station A21, Conception Bay, Newfoundland, from the underside of a rock at the LW line, and two others from a valve of *Modiolus* (*Volsella*) *modiolus* lying on the beach at C19, North Sydney, N.S. Several were also seen on waterlogged timber on the shore at C24, Neil's Harbour, N.S.

An arctic and arctic-boreal species; in America south to Long Island Sound.

5. **Balanus improvisus** Darwin, 1854

Fifteen specimens, nearly all bearing eyed eggs and nauplius stage I, were taken at stations C8 and C33; dead specimens were found on *Mytilus* shells at C19; others were observed on shore rocks, shells, and pilings, at S1; C2, 5, 9, and 21. On the basis of temperature requirements for spawning and other ecological factors, this species was expected to occur on

the Gulf coast of Newfoundland (Bousfield, 1954). However, despite intensive searching in hydrographically suitable estuaries of western and southern Newfoundland, *B. improvisus* was not found.

A typically brackish-water species, cosmopolitan in temperate and sub-tropical zones; north in Europe to the Baltic Sea and in America to Chaleur Bay, Gulf of St. Lawrence.

Class **Malacostraca**

Order **MYSIDACEA**

Subclass **Peracarida**

Family *Mysidae*

6. ***Mysis gaspensis*** Tattersall, 1954

One hundred and ninety-two specimens were taken at stations C3, 8 (inner), 12, 26; W1, 5, 12; N1; A2, 5, 11; B3, 10; mainly in shallow brackish bays and estuaries, in salinities of 10.6‰ to 30.6‰ and temperatures of 13.3° to 21.3° C. This species is closely related to *M. oculata* and has been recorded only from the St. Lawrence estuary and the Bay of Fundy (St. Andrews, N.B.). Frequently occurring in company with *M. stenolepis* and *Neomysis americana*, it tends to be replaced in warm estuaries by the former species.

7. ***Mysis stenolepis*** S. I. Smith, 1873

Sixty specimens were collected at stations C1, 3, 8, 16, 26, 28, 31, 33; W1, 3, 5, 12; N5; B3, 10, 13; in tidal pools and along the shores of shallow bays and estuaries, in salinities of 12.5‰ to 30.6‰ and temperatures of 16.0° to 23.8° C.

Distribution: East coast of N. America north to the Gulf of St. Lawrence (Tattersall, 1951); head of St. Lawrence estuary (Bousfield, 1955a). Common in estuaries of the southwestern part of the Gulf of St. Lawrence, which are warm in summer.

8. ***Neomysis americana*** S. I. Smith, 1873

Sixty-seven specimens were taken at stations C28; W3, 5, 12; A2, 5, 11; B10; in company with one or both of the previous two species, in salinities of 10.6‰ to 29.6‰ and temperatures of 14.5° to 21.3° C. Mature males and ovigerous females occurred in June, July, and August.

Distribution: East coast of N. America; Virginia north to the Gulf of St. Lawrence and St. Lawrence estuary.

Order **CUMACEA**

Family *Bodotriidae*

9. ***Leptocuma minor*** Calman, 1912

Fourteen specimens, all ovigerous females, were taken at station A11, mouth of the Biscay R., Avalon peninsula, Newfoundland, burrowing in the sandy wave-washed beach at the LW level, in company with *Amphiporeia lawrenciana*.

Distribution: New England states to Gulf of St. Lawrence; not previously recorded from Newfoundland.

Order ISOPODA  
Sub-Order VALVIFERA  
Family *Idotheidae*

10. ***Idothea baltica*** (Pallas) 1766

Sixty-five specimens were collected at stations S5; C1, 2, 3, 5, 10, 12, 16, 28, 31; W5, 7, 9, 12; A4, 7, 15; B3, 13; crawling on algae, *Zostera*, etc. or actively swimming at the low water line, in salinities of 16.2‰ to 31.4‰ and temperatures of 9.5° to 19.4° C. Ovigerous females are strikingly marked with contrasting colours; males are a uniform green mottled with small black spots.

Cosmopolitan in temperate seas; northward in Europe to the Scandinavian coast and in America to the Gulf of St. Lawrence.

11. ***Idothea phosphorea*** (Harger) 1874

More than forty-four specimens were taken at stations C1, 3, 11, 14, 16, 31; W1, 5, 8, 12; A2, 15; B3, 10; frequently in company with *I. baltica*, in salinities of 14.2‰ to 30.4‰ and temperatures of 12.2° to 21.3° C. On the Canadian Atlantic coast this species tends to be more estuarine and warm-brackish than the preceding species.

Distribution: Coast of New England to the Gulf of St. Lawrence (Kunkel, 1918).

Sub-Order ASELLOTA  
Family *Janiridae*

12. ***Jaera marina*** (Fabricius) 1780

syn: inclusive of forms *albifrons* Leach 1814  
*praehirsuta* Forsman 1949

More than one hundred and sixty specimens were collected at stations S2; C8, 10, 11, 14, 26, 28, 31, 33; W1, 3, 5, 7, 8, 10, 19; N3, 5; A2, 4, 5, 14, 15, 16, 20; B3, 4, 8, 10, 11, 13; on rocks, marine algae, *Zostera*, bivalve shells, etc., between high and low water lines, mainly on muddy and rocky shores, of open coasts and estuaries, in fully salt to nearly fresh water.

A widely euryhaline, eurythermal, arctic-boreal super-species of the North Atlantic; in America south to Connecticut. One of the most common sea-shore crustaceans of the Canadian Atlantic coast.

Family *Asellidae*

13. ***Asellus*** sp.

Fifteen specimens, including four ovigerous females, were taken at station C18, along the shores of Sydney R. Lake, Cape Breton Island, N.S.

According to J. G. Mackin (pers. comm.) this material is the species that Racovitza (1920) described as *A. communis* Say. Other material has been taken in the Gatineau River, Que., and near Chatterton, Ont.

## Sub-Order ONISCOIDEA

Family *Trichoniscidae*14. ***Trichoniscus pusillus pusillus*** (Brandt) 1833

Thirty-five specimens, including several ovigerous females, were collected at stations C8, 10, 26; W8; from beneath boards and stones, at the extreme HW mark, usually in company with *Porcellio scaber*.

Originally a European species, introduced to western and southern Newfoundland and a few localities in the Avalon peninsula; now able to survive away from human settlements (Palmén, 1951).

Family *Oniscidae*15. ***Oniscus asellus*** L. 1761

Thirteen specimens were taken at stations C10, 33; B9; from beneath debris at the HW line.

An Old World species now widely introduced and established in N. America. The present record from the Burin peninsula is in accord with the findings of Palmén (1951). The species is restricted apparently by temperature requirements for hibernation, to the south and southeast coast of Newfoundland.

16. ***Porcellio scaber*** Latreille, 1806

Seventy specimens were taken at stations S5; C3, 10, 17, 26, 33; W8, 10; A5, 15, 22; B13; from beneath litter, dried sea-wrack, etc., at the HW line, frequently in association with *Orchestia* spp.

A common and widely distributed, originally Old World species, introduced to Newfoundland by human colonists, where it is now everywhere to be found except in the northernmost part of the Long peninsula (Palmén, 1951).

## Order AMPHIPODA

## Sub-Order GAMMARIDEA

Family *Haustoriidae*17. ***Amphiporeia lawrenciana*** Shoemaker, 1929

Twenty-six specimens were taken at stations C16 and A11, at the mouths of short, shallow estuaries, burrowing in the wave-washed sandy bottom at the low-water line. Ovigerous females were found at C16.

Distribution: Bay of Fundy, Gulf of St. Lawrence between Cape Breton Island and Magdalen I., 4 to 43 fathoms (Shoemaker, 1930) and near shore at Seven Islands, Quebec (Bayne, 1908).

18. ***Amphiporeia virginiana*** Shoemaker, 1933

Three female specimens were found burrowing in a sandy-bottomed tidal pool at mid-tide level at station S2, Green Bay, Nova Scotia.

Known from the east coast of the United States from Virginia to Maine; not previously recorded from Canada.



19. **Haustorius arenarius** (Slabber) 1769

Nine specimens were taken at station C16, Langan, Cape Breton Island, burrowing in the sandy bottom washed by the estuarine outflow.

A mediterranean-boreal species of both European and American Atlantic coasts. In Canada previously recorded from Souris, P.E.I., Sept. 5, 1915, A. Willey coll. (basis for reference of Huntsman, 1924).

Family *Phoxocephalidae*

20. **Phoxocephalus holbolli** (Kroyer) 1842

Ten specimens (females) were collected at stations C14, 16; and W12; burrowing in sandy and sandy mud bottoms slightly below the LW line.

Widely distributed in the North Atlantic from the Arctic south to Connecticut and northern Europe.

Family *Calliopidae*

21. **Calliopius laeviusculus** (Kroyer) 1838

syn: *Gammarus* (*Gammarellus*) *macrophthalmus* Stimpson, 1853

One hundred and twenty-four specimens were taken at stations S2, 5; C1, 3, 10, 11 (outer), 14, 16, 28; W3, 5, 7, 8, 9, 12, 21; N3; A4, 7, 11 (outer), 14, 15, 16, 20; B4, 10; in salinities of 23.2‰ to 31.4‰ and temperatures of 9.5° to 19.4°C. A free-swimming essentially pelagic species of sandy and rocky coasts, among algae and in the breaker line. Less common in estuaries and warm water. On exposed rocky coasts it is frequently associated with *Gammarellus angulosus*, which it much resembles in habits and appearance.

Arctic-boreal and boreal; in America south to Long Island Sound.

Family *Pleustidae*

22. **Sympleustes glaber** Boeck, 1861

Fifteen specimens were taken at stations C1, 14; W7; A14, 21; among hydroids, under stones, just below the LW line, on moderately exposed rocky coasts. Salinities ranged from 30.4‰ to 31.4‰ and temperatures from 11.6° to 16.0°C.

An arctic-boreal shallow-water species extending southward in the Atlantic to Denmark and New England.

Family *Pontogeneiidae*

23. **Pontogeneia inermis** (Kroyer) 1838

A single specimen was taken at station C1 in wave-washed pools near the LW line. This species is essentially pelagic and occurs along cold rocky shores often in company with *Calliopius*.

Arctic-boreal; widespread in eastern Canada and the coast of New England.

## Family Gammaridae

24. *Gammarus oceanicus* Segerstrale, 1947syn: *Cancer locusta* L. 1758?*Gammarus ornatus* Milne-Edwards, 1830*Gammarus locusta* Holmes, 1904

Three hundred and twenty-six specimens were taken at stations S2, 5; C1, 3, 8, 10, 11, 14, 16, 26, 28, 31, 32, 33; W1, 3, 5, 7, 8, 9, 10, 12, 19, 21; N1, 3; A2, 4, 5, 7, 14, 15, 16, 20, 21, 22; B3, 4, 8, 10, 13; in salinities of 12.5‰ to 31.4‰ and temperatures of 9.5° to 21.3°C. Probably the most common aquatic amphipod species of the shores of eastern Canada, occurring on all types of bottom, mainly along the shore, under fucoids, etc., in the exposed part of the tidal zone nearly to mean HW line, and wherever minimum summer salinities are continuously greater than about 6‰. Apparently eurythermal in the vegetative phase of the life history but probably cold-stenothermal during the reproductive phase.

An arctic-boreal species of the North Atlantic ocean, extending southward in America to Long Island Sound, and in Europe to the English Channel (Spooner, 1951). Not in the high arctic (Segerstrale, 1947, 1948).

First described from Atlantic America as *G. ornatus* M.-E., the species was later synonymized with *G. locusta* L., redescribed as *G. zaddachi oceanicus* Segerstr. and recently, as a result of breeding experiments, raised to specific rank (Kinne, 1954).

In material from Canadian Atlantic estuaries the setation of the antennae, gnathopods, and urosome is richer, and the eye broader than in material from the open coasts. Also, the presence of feathery setae on the telson and the unusually rich setation of antennae in a few large male specimens approaches that of *G. setosus*. The possibility that *G. oceanicus* and *G. setosus* interbreed and produce sterile progeny would bear investigation.

25. *Gammarus setosus* Dementieva, 1931syn: *Gammarus boreus* Sabine, 1821 and 1824*Gammarus boreus* Bate, 1862

Thirty-eight specimens were taken at stations S5; C3, 28; W7; N1, 5; and B13. Although the lowest salinity here recorded for this species is 22.9‰, the localities above are to some degree influenced by fresh water. Appearance quite similar to *G. oceanicus*, but in life the peraeopods are distinctly banded.

Arctic and arctic-boreal, circumpolar; in eastern Canada recently recorded from Ungava Bay (Dunbar, 1954) and the St. Lawrence estuary (Bousfield, 1955a).

26. *Gammarus duebeni* Lilljeborg, 1851

Fifty specimens were taken at stations C28; W7; N5; A16; in rock pools at or above the HW line or in estuaries.

This species was first authentically recorded from North America from a fresh-water stream at Neil Harbour (near C24), Cape Breton

Island, by Shoemaker (1930), and has since been taken in the St. Lawrence estuary (Bousfield, 1955a). The records of Blake (1933) from Mt. Desert Island, Gulf of Maine, though not unexpected, may in part be based on specimens of *G. oceanicus*, which he does not list.

Probably widely distributed in the Canadian Atlantic area but frequently overlooked because of its restricted habitat along the coast. In the British Isles it occurs widely in fresh-water streams as well as brackish pools and estuaries (Hynes, 1954).

**27. *Gammarus lawrencianus* Bousfield, 1957a**

syn: *Gammarus annulatus* Huntsman, 1924

*G. annulatus* Shoemaker, 1930 *non* fig.

*non* *G. annulatus* S. I. Smith, 1873; Holmes, 1904

Two hundred and eighty-one specimens were taken at stations S1, 5, C3, 8, 11, 16, 26, 28, 31, 32, 33; W1, 3, 5, 10, 12, 15, 19; N1, 5; A2, 4, 5, 11; B3, 10, 13; in salinities of 10.6‰ to 31.0‰ and temperatures of 13.0° to 23.8°C. Widely distributed in the Gulf of St. Lawrence, St. Lawrence estuary, and Bay of Fundy regions; restricted almost entirely to brackish bays and estuaries, and seldom found on the open coast.

*Gammarus lawrencianus* is closely related to *G. annulatus* in lacking the lateral group of setae on abdominal segment 4, and in having antenna 2 longer than antenna 1, among other characters. It is, however, much smaller, less setose, but more robust than *G. annulatus*. On the Canadian Atlantic coast, *G. lawrencianus* occurs mainly on the bottom, among eel grass, etc., frequently in estuaries that are cold in summer (12–15°C). *G. annulatus* is a warm-water surface-swimming form of the Cape Cod region.

**28. *Gammarus fasciatus* Say, 1818**

This species was not taken during the present study but was collected by the writer at Pugwash (near S1) and Sonora (near S5), Nova Scotia, in 1950. In a lot from the Plateau river, Eastern Harbour, Cape Breton Island (near C31), taken by the Cheticamp Expedition, August 4, 1917 (but not reported upon by Shoemaker, 1930), the writer found seven specimens of this species, along with *G. lawrencianus* and *Gammarus mucronatus*.

*Gammarus fasciatus* is a species of large lakes, rivers, and heads of estuaries of American Atlantic and Mississippi drainages from the St. Lawrence south to Florida. Although occurring mainly in fresh water, it has been taken in salinities up to at least 12‰ (Bousfield, 1955b). Taxonomically, the species is related to *G. annulatus* and *G. lawrencianus* but appears to have taken a further step in migrating from salt to fresh water via estuaries.

Although the fresh-water and low-brackish regions of several estuaries were examined, the species was not taken in Newfoundland.

29. **Gammarus lacustris** G. O. Sars, 1864syn. *Gammarus limnaeus* S. I. Smith, 1874

Four specimens were taken along the shore at station W14, a small lake on the Harry's river system, western Newfoundland.

Widely distributed across Canada from the arctic ocean to northern United States mainly in small lakes and tundra ponds; previously unreported from Newfoundland. The recent work of Segerstrale (1954) on the tactile behaviour of *G. lacustris* indicates that the species may have been transported from the mainland to Newfoundland by birds.

30. **Gammarus (Marinogammarus) obtusatus** Dahl, 1938syn. *Gammarus marinus* Holmes, 1904; Kunkle, 1918 (*non* fig.)*non G. marinus* Leach, 1818

Forty-two specimens were taken at stations C1, 3; W7; A4, 14, 15, 20; B8, 11; where LW salinities ranged from 29.9‰ to 32.4‰ and temperatures from 10.6° to 16.0°C. Most abundantly found under stones and fucoids at the mid-tide level.

A boreal marine species of the shoreline; widely distributed in northern Europe but previously unreported (as *G. obtusatus*) from Canada. This species has been confused (by the writer, 1952, among others) with *G. marinus* Leach which has not yet been found in North America.

31. **Gammarus (Marinogammarus) stoerensis** Reid, 1938

Two ovigerous females were taken at station S2, Green Bay, Nova Scotia, from beneath stones in the tidal zone subject to fresh-water seepage at low water. The small body size and rudimentary condition of the inner ramus of the third uropods are specifically distinctive and compare exactly with specimens from Ireland kindly sent by Mr. C. Edwards.

North Atlantic boreal marine; northern and western Europe; previously unrecorded from North America.

32. **Gammarus mucronatus** Say, 1818syn: *Carinogammarus mucronatus* Holmes, 1904*non Gammarus macrophthalmus* Stimpson, 1853

Twenty-two specimens were collected at stations C11, 12, 26, 31, and 33, in salinities of 14.2‰ to 28.7‰, and temperatures of 17.2° to 23.8°C. This species is restricted to warm (in summer) brackish bays and estuaries of the American Atlantic coast from Florida north to The Gulf of St. Lawrence (Chaleur Bay). Not taken in Newfoundland.

33. **Gammarellus angulosus** (Rathke) 1843

One hundred and twenty-five specimens were taken at stations S2; C10; W8; A14, 15, 16<sup>1</sup>, 21; B8, 11; in salinities of 30.3‰ to 31.4‰ and temperatures of 9.5° to 14.4°C. A species of wave-washed, open, rocky coasts; free-swimming or clinging to algae, etc., at the LW line.

Sars (1895, p. 493) has remarked on the similarity of this species to *Calliopius laeviusculus*, both in habits and external appearance. This resemblance probably accounts for Stimpson's failure to recognize his

<sup>(1)</sup> Four immature specimens of *G. homari* were subsequently found among nine specimens of *G. angulosus* at Cape Spear.

*Gammarus macrophthalmus*, described (1853) from Grand Manan, N.B., as *Amphithoe laevisculus* Kroyer, 1838. Although differing slightly from Sars' figure in the size of the eyes, antennal setation, and other characters, the present material lends support to Sars' belief that this species is taxonomically and geographically distinct from the large arctic and arctic-boreal *G. homari* (J. C. Fabricius), which also occurs in the St. Lawrence estuary (Bousfield, 1955a).

Arctic-boreal; North Atlantic; in America south to Connecticut.

34. **Crangonyx (Eucrangonyx) occidentalis** Hubricht and Harrison, 1941

Eight immature specimens were found among stones and debris in a shallow bog pond and its outflow at station A8 in the Avalon peninsula, Newfoundland. At present this material cannot be separated from *Crangonyx occidentalis* Hubricht and Harrison, 1941, from bog ponds in Washington State, Pacific coast of America.

Distribution: Cold lakes of the Laurentian Shield, from Ontario to Newfoundland; southwestern British Columbia.

Family *Dexaminidae*

35. **Dexamine thea** Boeck 1861

Ten specimens were taken at stations S2; C14; B3, 4; in salinities of 29.1‰ to 30.5‰. This small species occurs under stones, among hydroids, tunicates, and other sessile organisms, below the LW line.

A boreal, littoral, marine species; North Atlantic; northern Europe and the New England states; now recorded from eastern Nova Scotia and Newfoundland.

Family *Talitridae*

36. **Orchestia platensis** Kroyer, 1844

syn: *Orchestia agilis*, S. I. Smith, 1874

Three hundred and fifty-five specimens were collected at S1, 2, 3, 4, 5; C1, 3, 8, 10, 11, 26, 28, 31, 33, 34; W1, 7, 8, 9, 10, 12, 21; A4, 7, 15, 20, 22; B3, 9, 10, 13; and observed at stations C4, 5, 17, 24, 32; B1, 15; under sea wrack, stones, sticks, and other debris at the HW line. The most common shore amphipod or beach flea of eastern North America; found on rocky, sandy, and muddy beaches of both estuaries and outer coasts.

Distribution: Cosmopolitan, temperate and subtropical, Atlantic and Pacific, shore to 3,000 feet altitude. On the American Atlantic coast it occurs north to the Gulf of St. Lawrence, Gaspé peninsula, and Anticosti Island (Bousfield, 1955a); now recorded from the west, south, and east coasts of Newfoundland.

37. **Orchestia grillus** Bosc, 1802

syn: *O. palustris*, S. I. Smith, 1874

Thirty specimens were taken at stations C12, 31; W5, 10; and observed at C32 and 33; under dried eel grass and fucoids, near the HW level in salt marshes.

American Atlantic coast from Texas north to Nova Scotia (Johansen, 1930), Cape Breton Island (Shoemaker, 1930), and now recorded from western Newfoundland.

38. **Orchestia gammarella** (Pallas) 1766

syn: *Orchestia littorea* Montagu, 1808

Seventy-seven specimens were taken at W8; N3, 5; A2, 5, 10; B4, 11; under stones and debris at the HW line. Although locally abundant, this large species was not commonly found in company with *O. platensis*.

Although this species is well known from European Atlantic coasts, published records of its occurrence in North America are lacking. C. R. Shoemaker (personal communication) has specimens from Machias Seal Rock in the Bay of Fundy; others from St. Andrews, N.B., and Argyle, western Nova Scotia, (auth. coll.) are at hand.

39. **Talorchestia longicornis** (Say) 1818

One hundred and seventy-eight specimens were taken at S1, 2, 3, 4; C6, 16, 19, 24, 27, 32, 34; W1, 5; and B9. This large whitish species is restricted to beaches of pure or nearly pure sand where it burrows and hides under debris at and above the HW line. In estuaries it extends landward to mean HW salinities of only 3‰ (Bousfield, 1955b).

Distribution: East coast of North America from Florida to the Gulf of St. Lawrence (Chaleur Bay); now recorded from western and southern Newfoundland; probably also on the long sand bar between the Miquelon Islands.

40. **Talorchestia megalophthalma** (Bate) 1862

Forty-eight specimens were taken at S2; C6, 24, 27; W1, 5; burrowing in the sand at the HW line in company with *T. longicornis*. *T. megalophthalma* is readily distinguished from the former species, even in young stages, by the larger, more protruding eyes, the anteriorly widened thorax, and the acute anteroventral angle of coxal plate 1. A species of outer sandy beaches, less frequently in estuaries; in more northerly and colder areas than *T. longicornis*.

Distribution: American-Atlantic coast; Long Island north to the St. Lawrence estuary north shore (Bousfield, 1955a), and Seven Islands, Que. (Bayne, 1908).

41. **Hyale nilsoni** (Rathke) 1843

syn: *Hyale prevosti* (Milne-Edwards) 1830?

One hundred specimens were taken at stations S2, 5; C11 (outer); W7, 8, 21; N5; A4, 5, 7, 14, 15, 16, 20, 21; B4, 8, 11. Found most abundantly about mid-tide level, on rocky beaches, under *Ascophyllum* and *Fucus*, less frequently near LW level.

Atlantic boreal; in Europe from Murmansk to the southwest coast of France, and in America from St. Lawrence estuary (Bousfield, 1955a) to Long Island (Kunkel, 1918). Not recorded from Ungava Bay by Dunbar (1954) and not previously from Newfoundland.



42. ***Hyalella azteca*** Saussure, 1858syn: *Hyalella knickerbockeri* Bate, 1862

Forty-nine specimens were taken at stations C11; W14; and A8; along the shores of shallow fresh-water lakes in company with *Gammarus lacustris* and *Crangonyx occidentalis*.

Widely distributed in rivers, lakes, streams, ponds, and heads of estuaries across Mexico, the United States, and southern Canada; previously recorded from Newfoundland by Johansen (1922).

Family *Amphithoidae*43. ***Amphithoe rubricata*** Montagu, 1808

One hundred and twenty-one specimens were taken at stations S2; C1, 3, 10, 11 (outer), 14, 28; W5, 7, 8, 21; A4, 7, 14, 15, 21; B4, 8, 11; in salinities of 23.2‰ to 31.2‰ and temperatures of 11.6° to 17.5° C. A nest-building species, fairly common along open rocky shores.

Widely distributed in the North Atlantic; White Sea to northwest France; in America from Labrador and the Gulf of St. Lawrence to Connecticut (Stephensen, 1942). North Pacific.

Family *Ischyroceridae*44. ***Ischyrocerus anguipes*** Kroyer, 1838

Sixty-nine specimens were collected at stations C1, 3, 10, 14; W7, 8, 21; A15, 16, 20, 21; B8; from beneath stones and among hydroids, etc., at the LW line, in salinities of 29.9‰ to 31.4‰ and temperatures of 9.5° to 17.4° C. Ovigerous females of two distinct size groups were noted in the present material.

Circumpolar; on the American Atlantic coast south to Cape Hatteras.

45. ***Jassa falcata*** Montagu, 1808syn: *Jassa pulchella* (Leach) 1815*Jassa marmorata* Holmes, 1904

Ninety specimens were taken at stations S2; C1, 11, 14, 28; W8; A4, 20; B4; under stones at the LW line, frequently with *Ischyrocerus*, in salinities of 29.6‰ to 30.9‰ and temperatures of 12.4° to 16.0° C.

Cosmopolitan temperate and subtropical zones; in the Atlantic north to north Norway and Gulf of St. Lawrence (Sexton and Reid, 1951).

Family *Corophiidae*46. ***Corophium insidiosum*** Crawford, 1937syn: *C. cylindricum* Say, 1818 (in part)

Fourteen specimens were taken at stations C8, 31; W1; in shallow-brackish estuaries, crawling upon the mud or on bivalve shells, eel grass, etc.

Cosmopolitan temperate zone; American Atlantic north to Chaleur Bay (Bousfield, 1955a). Previously recorded (as *C. cylindricum*) from the Magdalen Islands (Shoemaker, 1930) and western Newfoundland (Johansen, 1930).

47. **Corophium bonelli** (Milne-Edwards) 1830

Thirteen specimens were collected at stations C3, 14, 16, 28; W7, 8; B3; on muddy bottoms, under stones, etc. of semi-exposed coastlines, in salinities of 29.1‰ to 31.4‰ and temperatures of 12.4° to 19.5° C. No males were found in this material.

*C. bonelli* is "rather common on the coasts of Nova Scotia and New England" (Shoemaker, 1947) and widely distributed in the Atlantic and Pacific temperate zones. Previously unrecorded from Newfoundland.

48. **Corophium** sp.

One very immature male specimen was taken at station B13 in shallow water at the head of Mortier Bay, Burin peninsula, Newfoundland.

49. **Unciola irrorata** Say, 1818

Three specimens were collected at station C1, Janvrin Island, south coast of Cape Breton Island, under wave-washed stones at the LW level.

Distribution: Newfoundland (St. Pierre I.) to S. Carolina (Shoemaker, 1945).

Sub-Order HYPERIDEA

Family *Hyperiidæ*

50. **Hyperia medusarum** (O. F. Müller) 1776

One immature specimen was taken at station C28, from a medusa (*Tima formosa*) washed ashore in shallow Deadman's Cove, Cape Breton Island.

The species is pelagic and semiparasitic on jellyfish of coastal waters of the Arctic North Atlantic and Pacific oceans.

51. **Hyperia galba** (Montagu) 1813

Six immature specimens were taken at station C28 in company with the previous species in the *Tima* specimen. When the medusa (still living) was placed in a jar and formalin added to the water, the hyperiids left the jellyfish and swam about briefly before expiring.

Widely distributed in the arctic and boreal Atlantic; also south Atlantic and Antarctic.

Sub-Order CAPRELLIDEA

Family *Caprellidæ*

52. **Caprella septentrionalis** Kroyer, 1838

Nine specimens of this large arctic and Atlantic species were taken at stations C3, 14; W7, 8; A14; clinging to algae and hydroids at the LW line.

A species of cold rocky coasts in northeastern America and Europe; bathymetrically from the tide lines down.

53. **Caprella linearis** (L.) 1767

Seven specimens of this small, nearly transparent species were collected at stations A14 and B8, among hydroids, tunicates, etc. on the under side of stones at the LW line.

Arctic ocean; northern Europe; North America south to Long Island.

54. **Caprella acutifrons** Latreille, 1816

syn: *Caprella geometrica* Say, 1818

Three specimens of this small species, clinging to algae and beneath stones at the LW line, were taken at station C14, Morien Bay, Cape Breton Island.

Previously recorded from southern Europe and the eastern United States from Virginia to Cape Cod; now listed from eastern Canada.

55. **Caprella** sp.

More than fifty specimens (all immature) were taken at W8, Port-au-Port peninsula, Newfoundland, in company with *C. septentrionalis* at the LW line.

## Order DECAPODA

## Sub-Order MACRURA

## Family Hippolytidae

56. **Eualus gaimardii** (Milne-Edwards) 1837

syn: *Spirontocaris gaimardii* Rathbun, 1929

Seven small specimens were taken at station C3, Poulamond Wharf, Janvrin Island, N.S., among eel grass near shore at low water.

Arctic-boreal (circumpolar?); in North America south to Boston Harbour (Rathbun, 1929).

57. **Eualus pusiolus** Kroyer, 1842

syn: *Spirontocaris pusiola* Rathbun, 1929

One specimen was taken at station C14, Morien Bay, Cape Breton Island, among algae on the wave-washed rocky bottom at the LW line.

Arctic-boreal and boreal; Northern Europe, Iceland, and North America south to Chesapeake Bay.

## Family Palaemonidae

58. **Palaemonetes vulgaris** Say, 1818

Fourteen specimens were collected at stations C26, 31, 33; in shallow water, among eel grass, and on muddy bottoms in warm, polyhaline, brackish bays and estuaries.

Distribution: American Atlantic coast, Florida and the Gulf of Mexico north to the Gulf of St. Lawrence; not taken in Newfoundland.

Family *Cragonidae*59. **Crago septemspinosus** Say, 1818

Sixty-four specimens were taken at stations C8, 11, 16, 26, 28, 31, 33; W3, 5, 9, 10, 12; N5; A5, 11; B3, 10; in shallow water, on sandy and muddy bottoms, and among eel grass, in salinities of 10.6‰ to 31.0‰ and temperatures of 14.5° to 23.8°C.

A widely euryhaline, eurythermal, boreal species of the American Atlantic coast, from Florida to the Gulf of St. Lawrence (and Labrador?); Alaska, North Pacific.

Family *Homaridae*60. **Homarus americanus** Milne-Edwards, 1837

Dead specimens were observed on the beach of the following localities in Nova Scotia: S1, 3, 4; C7, 22, 28; and in Newfoundland at W9, 21; N1. Scarce on the outer Atlantic coasts of Newfoundland (Wilder, 1954).

Distribution: American Atlantic coast, Labrador to North Carolina.

## Sub-Order ANOMURA

Family *Paguridae*61. **Pagurus acadianus** Benedict, 1896

Ten specimens were collected at C16, and one at C21, east coast of Cape Breton Island, and one at W5, head of St. George's Bay, Newfoundland, in shallow water at the mouths of estuaries. One specimen (head and thorax only) was also taken at W9. Most animals occupied shells of *Polinices heros*, but two small specimens were housed in shells of *Littorina littorea* and one in *Buccinum undatum*.

Distribution: American Atlantic; Newfoundland and the Gulf of St. Lawrence to Chesapeake Bay.

## Sub-Order BRACHYURA

Family *Canceridae*62. **Cancer irroratus** Say, 1818

Twenty-eight specimens (11 males, 5 females, 12 imm.) were taken at stations S2; C1, 3, 10, 11 (outer), 14, 16, 28, 31; W3, 5, 7, 19, 21; B9; and observed at S1; C12, 17, 21, 27; W1; N1; A10, 14; in shallow water or along the shore, under rocks, etc., in salinities of 23.2‰ to 31.4‰ and temperatures of 9.5° to 19.4°C. The most common shore crab of eastern Canada, on rocky, sandy, and muddy bottoms of the outer coast and outer parts of estuaries.

Distribution: American Atlantic; Labrador to S. Carolina.

63. **Cancer borealis** Stimpson, 1859

One small specimen was taken at A5, Salmonier estuary, eastern Newfoundland, along the shore at low tide. Larger (dead) specimens were observed on shore at W11; N3; A10, 11; B3, 4, 6.

This species occurs mainly along the outer coast, and in somewhat deeper water than *C. irroratus*, from Nova Scotia to S. Carolina; not previously recorded from Newfoundland.

Family *Xanthidae*64. **Neopanopeus texana sayi** (Smith) 1879

Two male specimens were taken at C12, head of Morien Bay, Cape Breton Island, and a third was observed, but not taken, at C33, Mabou Inlet, on muddy bottom among eel grass. Apparently restricted to shallow bays and estuaries that are warm in summer.

Distribution: American Atlantic; Florida north to Prince Edward Island; not taken in Newfoundland.

Family *Majidae*65. **Hyas araneus** (L.) 1758

One male specimen was collected at station A21, Conception Bay, Newfoundland, under a large stone in a wave-washed tidal pool, and a dead specimen was observed on shore at A13.

An arctic-boreal species of northern Europe, Iceland, Greenland, Labrador, south to Rhode Island.

## ZOOGEOGRAPHICAL CONSIDERATIONS

Excluding terrestrial, fresh-water, and unidentified forms, the marine species in the material number 55. Of these 55 species, 35 (roughly 65 per cent) are common to Europe and America, and only 20 (35 per cent) are exclusively American Atlantic. Of the 35 amphi-Atlantic species, 19 (55 per cent) are arctic-boreal and panarctic forms, which have a continuous distribution from northern Europe via the Faroes, Iceland, Greenland, and Baffin Island to eastern Canada: seven (*Gammarus duebeni*, *Marinogammarus obtusatus*, *M. stoerensis*, *Dexamine thea*, *Orchestia gammarella*, *Hyale nilssoni*, and *Amphithoe rubricata*) are boreal, scarcely or not at all represented in Iceland, Greenland, and Baffin Island; two (*Haustorius arenarius*, *Caprella acutifrons*) are mediterranean-boreal not reaching northern Europe or Labrador; six (*Balanus improvisus*, *Idothea baltica*, *Orchestia platensis*, *Jassa falcata*, *Corophium insidiosum*, and *C. bonelli*) are cosmopolitan-temperate; and one (*Lepas anatifera*) is cosmopolitan-tropical. Of the 20 American Atlantic species, 14 (70 per cent) are boreal and probably extend to Labrador (Belle Isle Strait); three (*Mysis stenolepis*, *Orchestia grillus*, *Talorchestia longicornis*) are mediterranean-boreal and barely reach Newfoundland; and three (*Gammarus mucronatus*, *Palaemonetes vulgaris*, and *Neopanopeus texana sayi*) are mediterranean (Carolinian) warm temperate species that penetrate northward into

Canada only in warm (in summer) estuaries of Nova Scotia and the southwestern part of the Gulf of St. Lawrence. As a matter of interest, the 20 American endemic species comprise 100 per cent of the Cumaceans and Mysids and 70 per cent of the Decapods, but only 20 to 25 per cent of the Isopods and Amphipods and none of the Cirripedes of the present material.

The shore crustacean fauna of eastern Canada is essentially (70 per cent) cold temperate, and the species are about equally divided (19:21) between arctic-boreal and boreal. This result is in accord with the findings of Shoemaker (1930) concerning more than one hundred species of amphipods collected around Cape Breton Island by the Cheticamp Expedition in 1917.

The presence of so many amphi-Atlantic boreal and mediterranean-boreal shore crustaceans on the Canadian Atlantic coast raises the interesting question of their origin. As in the goose barnacle *Lepas*, it may be that semi-pelagic forms such as *Jassa falcata*, *Idothea baltica*, and even *Caprella acutifrons* are continuously rafted on floating algae, driftwood, etc., across the Atlantic. Transport by ships in relatively recent times has unquestionably resulted in the spread of littoral fouling organisms such as *Balanus improvisus*, *Corophium*, *Jassa*, and many others, but to what extent this affects the Canadian Atlantic distribution is merely speculative at the present time.

However, such means of dispersal would scarcely be effective in the case of boreal species such as *Gammarus duebeni*, *Marinogammarus* spp., and *Orchestia* spp., which have narrowly restricted habitats in the tidal zone. It appears more likely that at some former geological period the distribution of these amphi-Atlantic forms was continuous across the North Atlantic via Greenland, Iceland, and the Faroes. If this be true, the temperature requirements of these animals dictate that warmer seas must have been present in those northern areas at that time. The Post-Glacial Warm Period, 5000 to 2000 B.C., referred to by Ekman (1953), may have supplied the required conditions for boreal forms such as *Dexamine thea*, *Hyale nilssoni* and *Amphithoe rubricata*, in addition to those above. Indeed small populations of *Gammarus duebeni* still occur in warmer parts of Iceland and in warm brackish springs in Greenland (Hynes, 1954). Dunbar (1954) lists a few boreal marine relicts, perhaps of this same warm period, now found in James Bay and southern Labrador but not in the intervening region.

A pre-glacial or early Quaternary (Pliocene) warm period, much more extensive than the post-glacial warm period, would account for a continuous northern distribution of mediterranean-boreal forms such as *Haustorius arenarius*, and of forms ancestral to closely related species pairs in Europe and America such as *Homarus gammarus* and *H. americanus*; *Cancer pagarus* and *C. irroratus*; *Pagarus bernhardus* and *P. acadianus*; and *Crango* (Crangon) *vulgaris* and *C. septemspinosus*. Other forms such as *Mysis gaspensis* and *M. stenolepis* on the American Atlantic coast are very closely related to, and probably recently derived from, *M. oculata* and *M. mixta* respectively, both deeper water and less estuarine forms presently common to both sides of the North Atlantic. Probably also during the Pliocene warm period, the North Atlantic



and North Pacific boreal shore faunas were connected, but subsequent glaciation has cut off several species of *Cancer*, *Haustorius*, *Corophium*, *Crago*, *Pagarus*, *Amphithoe*, etc., in each northern ocean basin and left *Neomysis americana* and possibly *Idothea phosphorea* as relicts of Pacific origin on the American Atlantic coast.

Other boreal species are clearly of American endemic origin. *Unciola* is essentially American Atlantic with only one or two species (i.e., *U. leucopis*) reaching Europe via the Arctic. *Leptocuma* occurs in American north and south Atlantic; *Amphiporeia* is known only from the American Atlantic coast and only by the two species here listed; *Gammarus lawrencianus* is quite distinct from the *G. oceanicus-setosus* complex and forms part of an American endemic southern group which contains *G. annulatus*, *G. fasciatus*, *G. chesapeakensis* and *Gammarus mucronatus* (Bousfield, 1957a); and the large beach fleas *Orchestia grillus*, *Talorchestia longicornis*, and *T. megalophthalma* are unlike European counterparts and have probably been derived from Caribbean and western Atlantic ancestors. Finally, the American warm-temperate *Palaemonetes* is related to fresh-water species of the southern United States, and *Neopanopeus* is endemic to sub-tropical N. America and the West Indies.

The marine areas around Newfoundland, the Gulf of St. Lawrence, and the Nova Scotian shelf have recently been defined as a subarctic region, in which the upper water layers are of mixed polar and non-polar origin (Dunbar, 1953). Although this definition is meant to apply mainly to plankton and nekton and less to the sessile animals and plants, the present findings may be utilized in testing the applicability of the term "subarctic" to these areas.

With respect to the 41 marine forms taken in Newfoundland, 32 (80 per cent) are arctic-boreal and boreal; of these, 18 (more than half) are boreal. Undoubtedly, however, all the arctic-boreal forms presently found only in Cape Breton Island also occur in Newfoundland, and the proportion of arctic-boreal to boreal shore crustaceans would thus be about 50:50. The presence of three mediterranean-boreal species (*Orchestia grillus*, *Talorchestia longicornis*, and *Mysis stenolepis*), five cosmopolitan-temperate species (*Idothea baltica*, *Orchestia platensis*, *Jassa falcata*, *Corophium insidiosum* and *C. bonelli*), and the tropical *Lepas anatifera*, indicates non-arctic conditions in parts of the island. A non-arctic climate, even in winter, is particularly evident in southwestern and southern Newfoundland, where *Lepas* was found and where *Orchestia grillus*, *Talorchestia longicornis*, and *Corophium insidiosum* maintain footholds. Also, the nearly ice-free seas in winter (Ice Atlas, Northern Hemisphere) moderate the mainland to a degree that permits *Oniscus asellus* to populate the southern part of the island (Palmén, 1951).

Huntsman (1924) established the presence of relatively warm marine "pockets" along the northern and eastern shores of Newfoundland, coasts which are washed by cold waters of mixed Arctic and Atlantic waters (Labrador Current) during the entire year. The presence of *Mysis stenolepis* in the Exploits estuary, Notre Dame Bay, and perhaps also *Orchestia platensis* at Salmon Cove, Conception Bay, appears to corroborate Huntsman's findings.

Accentuating the essentially boreal or cold-temperate nature of the shore waters around Newfoundland, however, is the apparent absence of *Balanus improvisus*, *Gammarus mucronatus*, *Palaemonetes vulgaris*, and *Neopanopeus texana sayi*, warm-temperate forms that were specially searched for. Even in the southwestern part of the island, summer water temperatures are probably not sufficiently high, or if so, of too short duration, for successful reproduction and development in these forms. And if we consider (1) former warmer marine periods, and (2) already established mediterranean-boreal species of highly restricted intertidal habitats, it seems very unlikely that the four warm-temperate species (above), three of which have planktonic larvae, have never been able to reach Newfoundland.

Thus the present distribution of shore crustaceans indicates that the term "subarctic" (Dunbar, 1953) should not be applied unmodified to marine conditions (except perhaps briefly during the winter) on the southern and western shores of Newfoundland and the outer coast of Nova Scotia. Ekman (1953) concluded from an analysis of summer and mean annual water temperatures in these areas that the marine climate was boreal rather than arctic. Also, studies on the hydrography of the Gulf of St. Lawrence and Strait of Belle Isle (Lauzier *et al.*, 1951; Huntsman *et al.*, 1954) and on pelagic indicator animals in those areas (Bousfield, 1951; Huntsman *et al.*, 1954) show that the surface layer in the southern part of the Gulf and the west coast of Newfoundland north to the south side of Belle Isle Strait is essentially unmixed with, or else unrecognizably transformed from, arctic (polar) water. All these results suggest that the *proportion* of arctic water in the mixture should be taken into account in applying the term "subarctic" to the eastern Canadian marine region. These results, and others (e.g. Bousfield, 1955a) suggest also that if the southern limit of the subarctic marine region were set at a point where the polar fraction in the mixture ceases to predominate, or where it loses its temperature characteristics, the subarctic region would then extend southward along the outer coast of Newfoundland, probably to the Avalon peninsula, and southwestward along the north shore of the Gulf of St. Lawrence to Baie St. Paul and Rivière du Loup in the St. Lawrence estuary. Hence the coasts of southern and western Newfoundland and parts of eastern Nova Scotia that have minor elements of arctic water but a pronounced boreal fauna might more properly be termed the boreal-subarctic transitional region.

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## ADDITIONAL OCCURRENCES OF FOSSIL HORSE REMAINS IN WESTERN CANADA

*By Loris S. Russell*

### INTRODUCTION

Previous to 1939 fossils representing native species of the genus *Equus* were known in western Canada only from the Yukon gravels, and from a single tooth from Empress, Alberta, referred to *E. lambei* by Hay (1927, p. 273). The discovery of a large series of horse teeth in gravel of probable Pleistocene age at Sutherland, near Saskatoon, Saskatchewan (Russell, 1943), showed that at least one native species had been abundant on the Canadian plains. The Sutherland teeth were referred to *E. niobrarensis* Hay and compared with very similar teeth of this species from Hay Springs, Nebraska. It was thought likely that two species were represented in the series.

Since the description of the Sutherland finds, four other occurrences of fossil horse remains have been brought to my attention. These are all regarded as prehistoric, either because of the structure of the specimens, or because of their association with remains of extinct mammals. It is the purpose of the present report to place these occurrences on record. None of the specimens are in the collection of the National Museum, but their determination has been part of the work of the vertebrate palæontologist.

#### **Katepwa Beach, Saskatchewan**

This occurrence was reported by Dr. V. Rondeau, a dentist and amateur naturalist of Rouleau, Saskatchewan. Katepwa Beach is a resort village on Katepwa Lake in the Qu'Appelle Valley, about half-way between Regina and Melville. According to Dr. Rondeau, a gravel pit near the village has yielded mammoth bones for some years. Among the mammoth specimens collected by Dr. Rondeau are a tooth, a vertebra, and part of a pelvis. Horse remains from this gravel pit, submitted by Dr. Rondeau, include the following: (1) upper right second incisor, similar to the incisor figured (Russell, 1943, fig. 9) from Sutherland, but in a less advanced stage of wear, tentatively referred to *E. niobrarensis*; (2) the postzygophyses of the axis; (3) a proximal phalanx (water-worn); (4) the lower articular end of a femur. All specimens are in the private collection of Dr. Rondeau. A definite identification of the Katepwa Beach horse must await the finding of cheek teeth, but the association with mammoth remains indicates considerable antiquity.

#### **Fort Qu'Appelle, Saskatchewan**

This is a town in the Qu'Appelle Valley, on the Canadian National Railways between Regina and Melville. As the distance between Fort Qu'Appelle and Katepwa Beach is only about ten miles, it is probable that the two occurrences are in the same set of deposits. The Fort Qu'Appelle material consists of an upper left second molar, which can be referred

with some confidence to *E. niobrarensis*. It is similar to a Sutherland specimen (Russell, 1943, fig. 1) but is larger and has the enamel ridges more folded. There is also a fragmentary left metacarpal. These specimens were collected by Mr. Jerry Beaton and were submitted by Mr. Fred G. Bard, Director of the Saskatchewan Museum of Natural History, Regina.

#### Lancer, Saskatchewan

This is a village on the Canadian Pacific Railway, about sixty miles northwest of Swift Current. From a gravel pit here Mr. R. W. Anderson collected the lower right cheek tooth of a horse, probably the fourth premolar. It is similar to a lower left fourth premolar from Sutherland (Russell, 1943, fig. 8) but has the enamel ridges less crenulated. It is tentatively referred to *E. niobrarensis*. The specimen is in the Saskatchewan Museum of Natural History, Regina.

#### Smoky River, Alberta

This locality is a gravel pit in the valley of Smoky River, about twenty-seven miles east of Grande Prairie, near the crossing of Highway 34. Workmen excavating here found bones in gravel and sand some twelve to twenty feet below the surface. These bones were obtained by Mr. Robert Cochrane, amateur naturalist of Grande Prairie, and submitted to me for identification. Among them was a bison horn core, which, because of its length, moderate curvature, and orientation relative to the skull, can be referred with confidence to *Simobison antiquus* (Leidy). Numerous associated bison bones probably also represent this species, as they are larger than the average size of the corresponding bones of *B. bison*. Horse remains from the Smoky River gravel pit consist of a worn cervical vertebra, probably the fourth, and a well-preserved left tibia. The size of both bones is less than average for the domestic horse. The golden brown colour of the bones, as well as their greater than normal weight, suggests a long period of burial in the gravel. Because of the small size of the bones and their association with remains of an extinct bison, it is concluded that one of the native American species of horse is represented. Specific determination will await the discovery of well-preserved teeth. The specimens are in the private collection of Mr. Robert Cochrane, Grande Prairie, Alberta.

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## THE SHELL OF *BASILEMYS VARIALOSA* (COPE)

By Wann Langston, Jr.

### INTRODUCTION

*Basilemys* is an extinct genus of large dermatemydid turtles whose fossilized remains occur in Upper Cretaceous—mainly fluviatile—sediments of North America. There are six described species: *Basilemys varialosa* (Cope), *B. imbricaria* (Cope), *B. ogmia* (Cope), *B. sinuosa* Riggs, *B. nobilis* Hay, and *B. praeclara* Hay. Only the shells have been described, and only those of *B. sinuosa* and *B. nobilis* are adequately known. The plastron and bridge of *B. varialosa* have been accurately reconstructed by Hay (1908, fig. 287), and Lambe (1901, 1902) has written detailed descriptions of the plastron. Parks (1933, pl. 10) figured a complete shell of this species in the Royal Ontario Museum of Zoology and Palæontology, but offered little by way of description. A good shell of *B. varialosa* in the National Museum of Canada now provides a basis for a description of the carapace and a check upon the accuracy of Hay's reconstruction of the plastron.

The specimen, N.M.C. No. 8516, was discovered in 1914 by George F. Sternberg in Upper Cretaceous rocks of the Oldman formation, in sec. 22, tp. 21, rge. 12, W. of the 4th Mer., Alberta. This is about 2.5 miles southeast of the mouth of Berry Creek on the east side of the Red Deer River.

The carapace was evidently exposed when found, and the shell has been checked and broken. The upper part of the bridge and thus all contact between plastron and carapace have been destroyed on either side. Whatever vertical distortion there may have been seems to have been largely corrected in the reconstructed shell. The carapace is skewed to the left side. Missing are major parts of the left marginal plates 3 to 10, right marginals 7 to 9, left costal 1, right costals 5 and 6, neural plates 5 to 8, and the central part of the nuchal plate. Nevertheless the geography of the carapace, except for the last four neural plates, can be readily ascertained from one side or the other, and even these missing plates are probably restored with reasonable accuracy. The outlines of the scales are perfectly clear. The plastron is virtually complete except for the tip of the anterior lobe.

### ACKNOWLEDGMENTS

I am indebted to Dr. L. S. Russell of the National Museum of Canada for providing some preliminary notes on N.M.C. No. 8516, which have been incorporated in the description of the carapace of *B. varialosa*. Dr. E. H. Colbert kindly gave me permission to examine type material of *B. varialosa* and *B. imbricaria* in the American Museum of Natural History. The drawings are the work of Mr. John Crosby, Staff artist with the Zoology Section, National Museum of Canada.

## DESCRIPTION

The maximum length of the carapace is 940 mm., its restored width over 800 mm. In depth it nowhere exceeds 145 mm. The costal and neural bones are thin for a shell of these dimensions, but the marginal plates become greatly thickened around the anterior and posterior edges of the carapace. The sulci are generally deep but become shallower peripherally. All surfaces overlain by scales in life are sculptured in the characteristic *Basilemys* pattern. This consists of thousands of linearly arranged but not always parallel pits bounded by ridges of varying sharpness. These ridges generally intersect in three's, producing small trihedral pyramids which may be very sharp, especially around the edges of the marginal plates and around the free edges of the plastron. The sculpture is subdued on the broad surfaces, particularly of the carapace. Its texture is little altered when crossing sutures, except where the pits sometimes elongate forming shallow and parallel striae—for example, on either side of the hypo-hyoplastral suture. The sculpture often disappears suddenly at the sulci where the bone becomes smooth but highly porous. Irregular spots on the carapace are devoid of sculpture owing probably to necrotic erosion beneath the scales. In some of these areas the surface of the bone is fibrous. In life the scales were presumably very thin.

The reconstructed carapace (Figure 1) appears widest at the level of the eighth neural plate; posteriorly it narrows rapidly, anteriorly very slowly to the posterior level of the nuchal plate, but in life the sides were more rounded between these two points (Figure 2a). Posteriorly the carapace is broadly rounded with marginal plates 10 and 11 arched, and the pygal plate depressed. The nuchal margin is broadly emarginated. Marginal plates 1 and 2 are flared out and upward toward their free edges, producing a wide trough between the edge of the shell and the hump made by an elevation of the anterior neural and nuchal surfaces. The nuchal plate apparently widened posteriorly, thereby restricting the costal margins of the first marginal plates. It is much thickened marginally and deeply notched anteromedially. Costiform processes are not apparent. Presumably eight neurals were visible externally. The first was the longest and has from two to three times the area of any other. All were narrow compared to the width of the overlying scales, but suspected shortening of the sixth and seventh neurals probably produced plates that were at least as wide as long. There are two suprapygal plates; the anterior one is small and square, the second relatively huge and fan-shaped. The first is completely bounded laterally by the eighth costal. The second is met laterally and posteriorly by the last two marginals and the pygal plate, which is about a third as broad as the posterior suprapygal. The costal plates are about as long proximally as distally, except costals 6 and 7 which narrow toward the midline, and 8 which widens in that direction. None of the costals exceeds in length two and one-half times its antero-posterior diameter distally. Nothing remains to indicate whether any posterior costal plates met in the midline in dermatemydid fashion as they

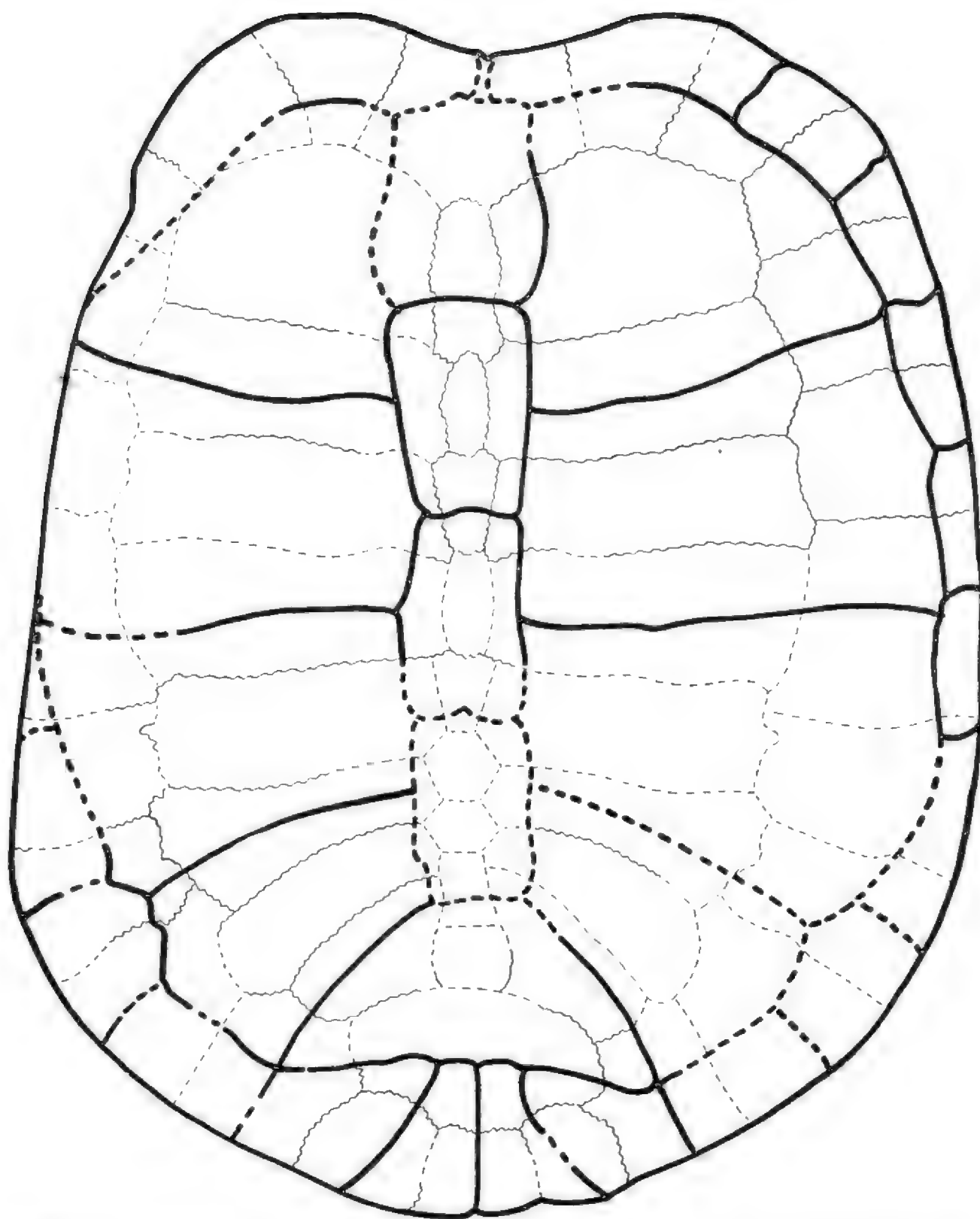


Figure 1. *Basilemys varialosa* (Cope), N.M.C. No. 8516. Carapace as reconstructed in mounted specimen. Approximately 1/7 natural size.

are reported to do in *B. nobilis*, or were separated by neural plates as in *B. sinuosa*. The reconstruction of this part of the shell is based on the latter species. Presumably there were eleven marginal plates on each side of the carapace. They are all very broad dorsally, each behind the third having an area at least equal to that of the contiguous costals.

The outlines of the vertebral and costal scales are clearly shown in the illustrations. The peripheral scales were wide behind the level of the bridge. Over the bridge they were roughly equal in length and from two to three times as long as wide dorsally. Ventrally these scales were very extensive owing to the great width of the bridge and the absence of large inframarginals. The sixth was twice as long basally as dorsally. This ventral expansion results in a corresponding narrowing of the adjacent peripherals 5 and 7. The fourth peripheral also narrows toward the plastron where it becomes about as wide as the fifth; the sulcus between them is nearly transverse. The seventh and eighth peripheral scales were pointed at their plastral ends, the eighth more acutely than the seventh. Of inframarginals there were only narrow axillary and inguinal scales. The nuchal scale was tiny, measuring not more than 7 mm. in width at the edge of the carapace. It was evidently deeply cleft at the edge of the shell.

The plastron of *Basilemys variatosa* has been so well described by Hay that further words are unnecessary. The major features of the plastron at hand are clearly shown in the accompanying illustrations. Its length was about 785 mm., but the tip of the epiplastral beak is restored.

## DISCUSSION

Although *Basilemys variatosa* is a fairly common fossil in some Upper Cretaceous deposits, there are few good specimens. The drawings in Figure 2 are based on several specimens in the National Museum of Canada, all of which are fragmentary except N.M.C. No. 8516. A comparison of these figures with shells of other species of *Basilemys* reveals a similarity in general outline. The carapace of *Basilemys sinuosa* differs from *B. variatosa* mainly in the presence of three suprapygal plates rather than two; if suprapygals 2 and 3 were one element, its outline and relative size would be almost identical with the posterior suprapygal of *B. variatosa*. The pygal plate of *B. sinuosa* is relatively tiny. Neural plates—especially the first—are a little wider and shorter, and all the marginals appear to be narrower. On the other hand, scales of the carapace, excepting the peripherals and the fifth vertebral, are broader than in *B. variatosa*. Some of these proportional differences may be of ontogenetic nature, because the single known specimen of *B. sinuosa* is slightly smaller than N.M.C. No. 8516. Probably the former represents a female, which would be expected to show some differences in the shape of the shell.

The plastron of *B. sinuosa* has a shorter anterior lobe, but it is terminated more acutely anteriorly than in several *B. variatosa* plastrs. The posterior lobe, though shorter, extends farther posteriorly, suggesting that the type of *B. sinuosa* may have been a female. The principal difference between the plastrs of these species is the outline and relative size of the gular and intergular scales: the gulars of *B. variatosa* are very small and are widely separated by large double intergular scales; but the gulars of

*B. sinuosa* meet in the midline, separate the intergulars from the humerals, and almost separate the humerals themselves. The sinuous course of the median sulcus, to which *B. sinuosa* owes its name, differs strikingly from that of other *Basilemys*, especially *B. variolosa*, but the taxonomic importance of this may have been overemphasized. Riggs interpreted as an inguinal scale what, to judge from other *Basilemys* shells, is probably the eighth peripheral. He shows a narrow extension of the abdominal scale posteriorly into the inguinal notch where the inguinal scale has been recorded in *B. nobilis*. Evidently the short sulcus bounding this narrow inguinal scale anteriorly is indistinct there, as it is in N.M.C. No. 8516.

*Basilemys variolosa* resembles *B. nobilis*<sup>1</sup> more closely in most respects. *B. nobilis* has a more oval shell. Wiman's specimen shows costal plates 7, and presumably 8, meeting in the midline in usual dermatemydid fashion as they may do, but probably do not, in *B. variolosa*, and certainly do not in *B. sinuosa*. *B. nobilis* is said to have a large triangular inframarginal scale interposed basally between peripherals 6 and 7. In this it differs from the other species of *Basilemys*, and Gilmore's specimen (whose plastron is well preserved) shows no sign of this scale. The intergular scale was undivided, differing thus from all other species of *Basilemys*.

*Compsemys ogmia*, later assigned to *Basilemys*, and *B. imbricaria* are based on scraps. Although the first has nomenclatural priority over *B. variolosa* with which it could be identical, examination of the two preserved water-worn fragments shows that they cannot possibly be identified specifically, and *B. ogmia* should be regarded as a *nomen vanum*. *B. imbricaria* was characterized principally by its sculpture, but in writing of *B. sinuosa* Riggs (1906, p. 255) notes that "the sculpture in various regions of the carapace and plastron varies so widely that no area could be taken as typical." This is true of *B. variolosa* and so probably of *B. imbricaria*. A fragment that accompanied the type fragments of *B. imbricaria* in the Cope collection was thought by Hay to differ specifically from *B. variolosa*, because the distance between the lip of the shell and the insertion of the skin was less than in his specimens of *B. variolosa*. However, the sculpture is similar to *B. variolosa*, and Hay was not sure of the position of the fragment in the shell (he supposed it was an anterior marginal). For practical purposes *B. imbricaria* can also be treated as a *nomen vanum*.

*Basilemys praeclara* Hay (1910) has a peculiarly shaped epiplastral lip and, as in *B. sinuosa*, the gular scales were large, meeting in the midline and crowding the intergulars forward beyond the anterior limit of the entoplastron, which in all other *Basilemys* they overlie.

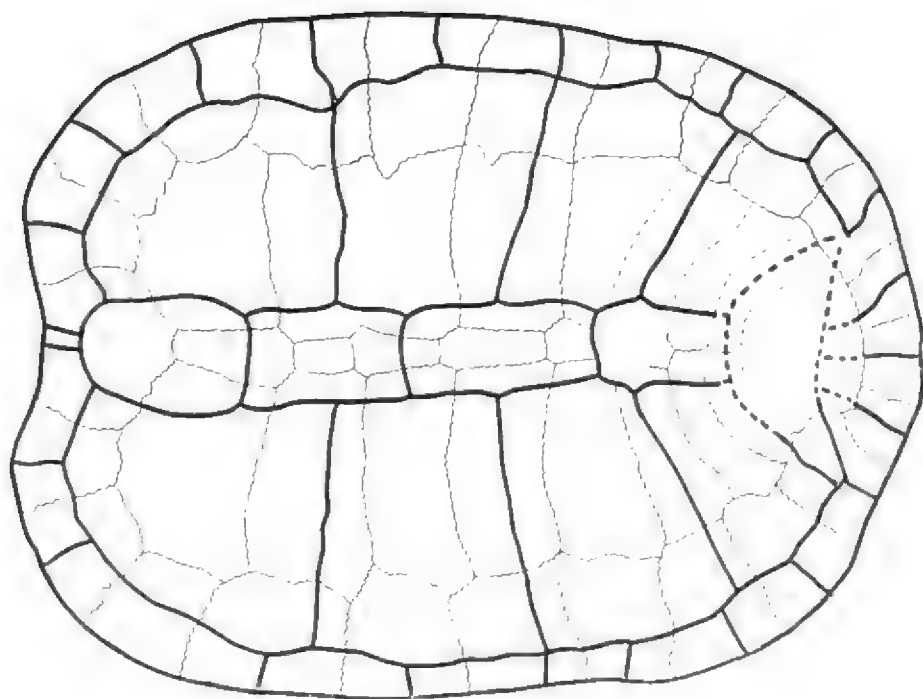
In summary the genus *Basilemys* can be defined as follows:

### **Basilemys Hay**

Large and aberrant dermatemydid turtles with broad flattened shells of roughly oval outline. Bridge wide, plastral lobes short. Margins of

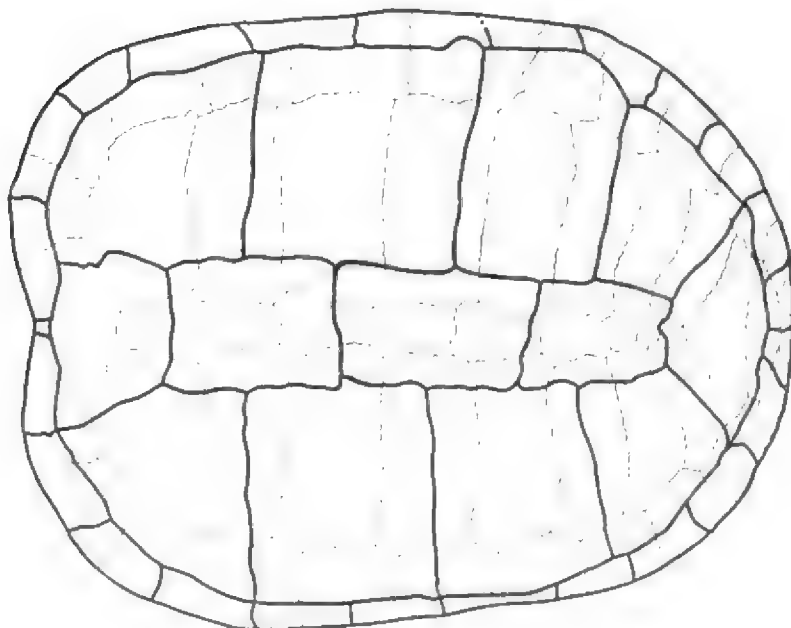
<sup>1</sup>Gilmore (1935) notes that this species is based on material that is probably not specifically identifiable. He and Wiman (1933) have, however, referred other specimens to the species on geographic and stratigraphic grounds. Since Wiman's specimen is so well described and figured, we may assume that his identification is correct for all practical purposes. Gilmore's material does not entirely agree with it owing perhaps to its poorer state of preservation and obviously older age of the animal. Gilmore attributed a difference in the shape of the epiplastral beak to sexual dimorphism.

C



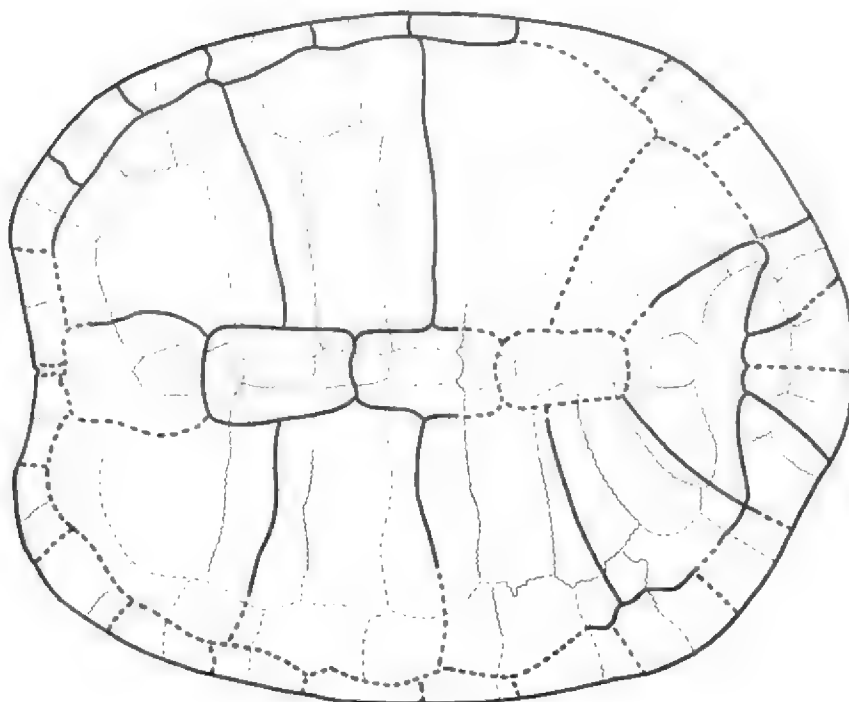
747 mm

B



650 mm

A



785 mm



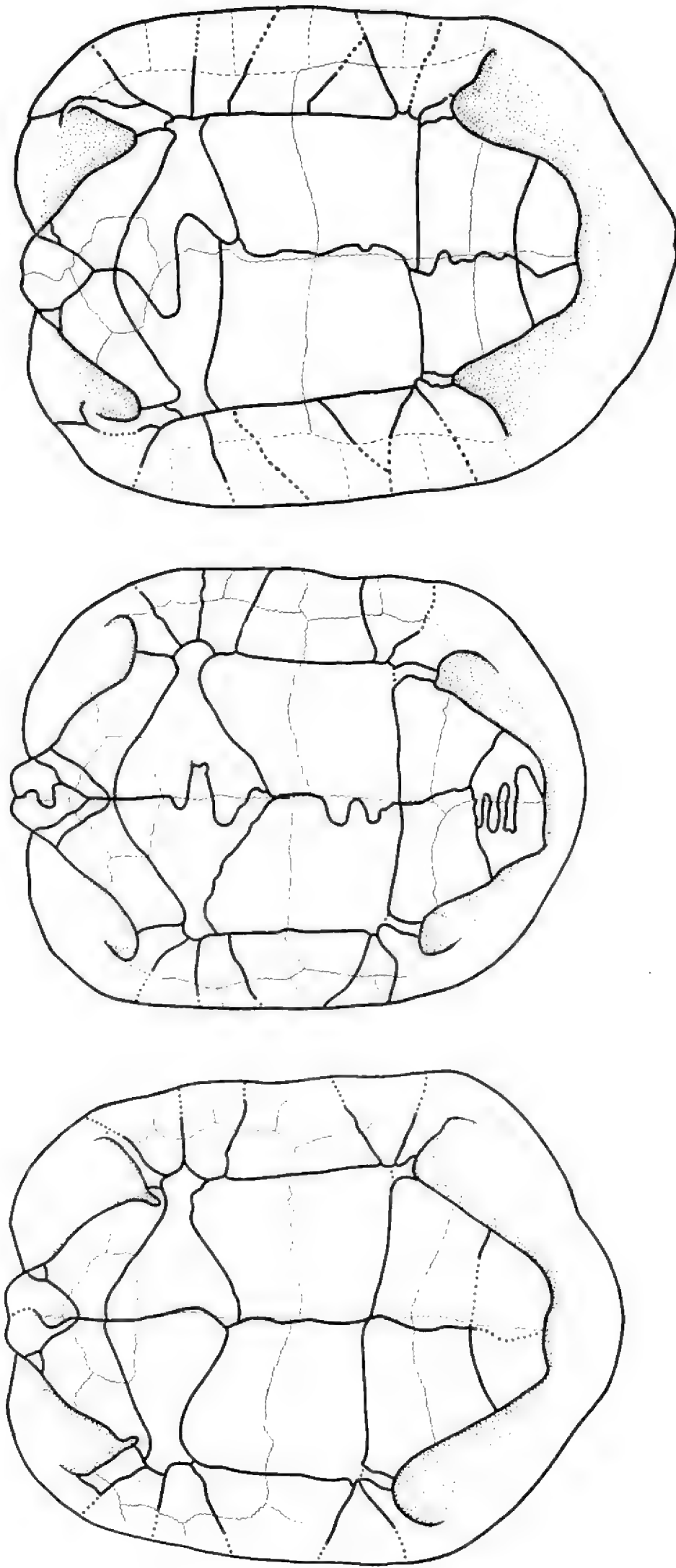


Figure 2. Shells of *Basilemys*: A, *B. variolosa* (Cope), B, *B. sinuosa* Riggs, C, *B. nobilis* Hay. Figures not to scale; plastra reduced to same length (measurement in mm. is length of plastron). A, from National Museum of Canada specimens 209, 376, 1145, 8516, carapace somewhat reconstructed; B, modified from Riggs; C, modified from Wiman.

shell greatly thickened, particularly around epiplastra. Sculpture very heavy, pitted. Two or three suprapygial plates, posterior costals meeting in midline or not. Intergular scale present, divided or not; gular scales large or small, meeting in midline or not. Pectoral scales greatly expanded at midline, narrowed laterally. Inframarginal scales reduced in size and number. Nuchal scale tiny. Probably inhabited streams and rivers.

Type: *Compsemys variatosa* Cope. Upper Cretaceous of North America.

**B. variatosa** (Cope). *Basilemys* with acutely triangular anterior plastral lobe, small gular scales widely separated by divided intergulars. Two suprapygial plates; pygal plate large. Small axillary and inguinal scales present, no other inframarginals. Probably no costal plates meet in the midline.

Known from complete shells. Oldman, Upper Milk River formations of Alberta; Judith River beds of Montana, Campanian.

**B. nobilis** Hay. *Basilemys* resembling *B. variatosa* except costal plates 7 and probably 8 meet in midline, intergular scale not divided, and with a large inframarginal scale intercalated between peripheral scales 6 and 7.

Known from complete shells. Ojo Alamo, Kirtland formations of New Mexico. Maestrichtian.

**B. sinuosa** Riggs. *Basilemys* resembling *B. variatosa* except anterior plastral lobe shorter and with more acute epiplastral beak, three suprapygial plates present, gular scales meeting in midline and almost separating humeral scales. Midplastral sulcus highly sinuous.

Known from a complete shell. "Laramie beds" of Montana. Maestrichtian.

**B. praeclara** Hay. *Basilemys* with large intergular scales widely separating divided gulars from humerals. Intergular scales do not overlies entoplastron.

Known from epiplastral beak, nuchal bone, and fragments. "Lance formation" of South Dakota. Maestrichtian.

Nomena vana: *B. imbricaria* (Cope), *B. ogmia* (Cope).

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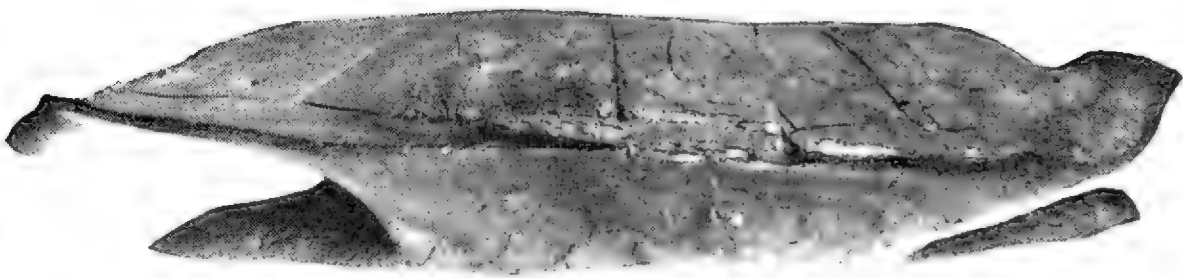
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## PLATE I



*Basilemys variolosa* (Cope), N.M.C. No. 8516. Carapace and plastron as mounted. Approximately  $1/9$  natural size.



*Basilemys variatosa* (Cope), N.M.C. No. 8516. Above, right lateral view of reconstructed shell. Approximately  $1/9$  natural size. Below, detail of sculpture. Suture is between right hyo- and hypoplastron; humero-abdominal sulcus at upper right. Approximately natural size.



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- GESSAIN, ROBERT. La Tache Pigmentaire Congénitale chez les Eskimo d'Angmassalik (*Journal de la Société des Américanistes*, XLII, 1953, 301-32). A critical study of the Mongol spot among East Greenland Eskimo children. Data are given on the shape of the spot, or spots, the duration of their survival, and the percentage of the population having them.
- GODFREY, WILLIAM S. Answer to "Plaster under the Tower" (*American Antiquity*, XIX (3), Jan., 1954, 277-79). In answer to a criticism by Pohl (q.v.), the author reaffirms his belief that his excavation at the Newport Tower proves the structure to have been erected in the Colonial Period, and not to be of Norse origin.
- GODELL, PHILIP H. Old Time Travel (*North of 55°*, edited by Clifford Wilson, Toronto, Ryerson Press, 1954, 162-9). A popular article on sledge and canoe travel in the Far North, with a few details of Eskimo and Indian techniques.
- GREENLEES, STEPHEN. Indian Canoe Makers (*The Beaver*, Outfit 285, summer, 1954, 46-9). Cree Indians at Rupert's House have manufactured canoes for centuries. The modern methods now in use are described and illustrated in this interesting article.

- GUNTHER, ERNA. *Indians of the Northwest Coast*. Colorado Springs: Taylor Museum of the Colorado Springs Fine Arts Center; and Seattle: Seattle Art Museum. N.d. Pp. [48]. A beautifully illustrated pamphlet, prepared to accompany an exhibition of Northwest Coast Indian art held in Denver. The text includes an outline of Northwest Coast culture, with a balanced description of art styles, and the techniques of manufacture. The illustrations are well chosen. This is an excellent introduction to a complex subject compressed in a masterly fashion.
- HAEKEL, JOSEF. The concept of a Supreme Being among the Northwest-Coast Tribes of North America (*Wiener Volkerkundliche Mitteilungen*, II (2), 1954, 171-83). A preliminary but scholarly comparison of the religion of the Bella Coola of coastal British Columbia with that of tribes of the interior suggests that the concept of a creator deity is a very old coastal trait, adopted by the Bella Coola on coming to the coast.
- HAMMERICH, L. L. The Dialect of Nunivak (*Proceedings of the Thirtieth Congress of Americanists*, Cambridge, 1952, London, n.d., 110-13). A brief note on phonology and lexicology of the Nunivak dialect, a branch of the Western Eskimo language.
- Russian Loan-Words in Alaska (*Proceedings of the Thirtieth Congress of Americanists*, Cambridge, 1952, London, n.d., 114-26). An extensive list of words of Russian origin found in the Aleut and Alaskan Eskimo languages.
- HANKS, L. M., JR. A Psychological Exploration in the Blackfoot Language (*International Journal of American Linguistics*, XX (3), July, 1954, 195-205). By studying the range of meanings of a single word and its derivatives, the author illustrates how this approach can throw light on the interests and psychology of a group.
- HATT, GUDMUND. Early Intrusion of Agriculture in the North Atlantic Subarctic (sic.) Region (*Anthropological Papers of the University of Alaska*, II (1), Dec., 1953, 51-107). A scholarly study of the northern extension of horse agriculture in Scandinavia, the Faroes, Iceland, and Greenland, with implications regarding possible prehistoric contacts with America.
- HAWTHORN, H. B. Enter the European: IV. Among the Indians of Canada (*The Beaver*, Outfit 285, summer, 1954, 3-7). Contact between white and Indian followed various patterns in different parts of Canada, but it always meant a clash of cultures, and many of the strains are still apparent.
- HIMMELHEBER, HANS. *Der Gefrorene Pfad*. Eisenach, 1951. Pp. 135. A series of Nunivak Eskimo legends, recorded in popular style.
- HIRSCH, DAVID I. Glottochronology and Eskimo and Eskimo-Aleut Prehistory (*American Anthropologist*, LVI (5), Part 1, Oct., 1954, 825-38). A reasoned analysis of the implications of the findings of glottochronology in regard to Eskimo history and prehistory and the period of separation of different groups.
- HOLMER, NILS M. *The Ojibway on Walpole Island, Ontario* (*Uppsala Canadian Studies*, No. 4). Uppsala and Copenhagen, 1954. Pp. 91. This is a significant contribution to the little-known Walpole Island dialect of Ojibwa, and, accordingly, to the comparative study of the Algonkian languages. Although the treatment is not sufficiently full to be regarded as definitive, it is important. Apart entirely from the subject matter, it is significant as the work of a Swedish scholar, supported by a Swedish institution.
- HONIGMANN, IRMA, and JOHN HONIGMANN. Child-rearing Patterns among the Great Whale River Eskimo (*Anthropological Paper of the University of Alaska*, II (1), Dec., 1953, 31-50). A thorough study of infant care and education among the Eskimo of the southeast corner of Hudson Bay.
- HONIGMANN, JOHN J. *The Kaska Indians: An Ethnographic Reconstruction* (Yale University Publications in Anthropology, LI). New Haven; Yale University Press, 1954. Pp. 163. This important volume comprises a reconstruction of aboriginal Kaska culture, based both on observation and on information obtained from informants familiar with the old way of life. After a thorough description of the local bands usually included under the terms *Kaska* and *Nahanni*, the author gives a detailed picture of the culture of the different groups. In doing so, he divides his material into sections on way of life, social organization, religion, and annual cycle, with specific description of variations in each local band. With the inevitable



breakdown of aboriginal life, this volume provides a definitive study of the Athapaskan Indians of northern British Columbia and the Yukon. It is enhanced by the author's analytical comparison of the distribution of Athapaskan culture traits.

HOUSTON, JAMES A. *Canadian Eskimo Art* (Photographs by Bert Beaver and the National Film Board). Ottawa: Department of Northern Affairs and National Resources. 1954. 40 pages. A beautifully illustrated album of modern Eskimo art, with a thoughtful description of the place of art in the life of these people. Emphasis is laid on stone sculpture with a few examples of pictorial work.

Indian Health Services (In Canada. Department of National Health and Welfare, *Annual Report for the Fiscal Year Ended March 31, 1953*, Ottawa, 1953, 33-6). This report contains data on the hospitalization of Indians and Eskimo, as well as a general statement concerning health services provided for them by the government.

*The Indian News* (I (1), Oct., 1954, quarterly). Ottawa: Indian Affairs Branch, Department of Citizenship and Immigration. This is an attractively illustrated newspaper, issued quarterly by the government for free distribution to Indians, containing news items about Indians in different parts of Canada.

JAMES, BERNARD J. Some Critical Observations concerning Analyses of Chippewa "Atomism" and Chippewa Personality (*American Anthropologist*, LVI, (2), Part 1, April, 1954, 283-86). The Ojibwa (Chippewa) are usually described as individualistic and non-cooperative, supposedly because of their loose social organization and scattered population. The author points out that these conditions were not characteristic of the southern Ojibwa at the time of European contact, and questions the validity of the personality traits attributed to them.

JENNESS, DIAMOND. Canada's Indians Yesterday. What of Today? (*The Canadian Journal of Economics and Political Science*, XX (1), Feb., 1954, 95-100). During the period of 1920-30, there was a great deal of antipathy toward the Indians in all parts of Canada except, perhaps, in Quebec. This was largely due to the *apartheid* policy of the government in regard to the segregation of the Indians on reserves. Although there has been much improvement since that date, the Indians have not been integrated into the life of Canada.

— Enter the European: Among the Eskimos (*The Beaver*, Outfit 285, winter, 1954, 24-30). In general terms, the impact of the white man upon the Eskimo has followed one of three different patterns. In Greenland, after an initial period of chaos, the Danish government closed the island to foreign contact as a means of protecting the natives; this policy has led to intermixture between Scandinavian settlers and native Greenlanders, and to a virile Eskimo-speaking population. In Alaska the United States government has followed a paternalistic attitude, with the introduction of reindeer and the establishment of schools and social agencies. Contact in the Canadian Arctic was primarily with fur traders; through disease and diet deficiencies the population diminished, and it is only recently that active steps have been taken by the Government to protect the welfare of the Eskimo.

JOHNSTONE, BARBARA. Big Donald of the Blackfeet (*The Beaver*, Outfit 285, winter, 1954, 20-2). In order to have adequate interpreters, as well as to establish friendly relations with the Blackfoot, two employees of the Hudson's Bay Company at Fort Edmonton were sent, in 1807, to live among these Indians for two years. One of these volunteers was Donald MacDonald.

JURY, WILFRID, and ELSIE McLEOD JURY. *Sainte-Marie among the Hurons*. Toronto: Oxford University Press. 1954. Pp. xiii, 128, xxviii. This is a description, in semi-popular style, of the archaeological investigation and reconstruction of Sainte-Marie, centre of the Jesuit missions to Huronia in the seventeenth century. The site is one of great importance in the field of ethno-history.

KEHOE, THOMAS F. Stone "Medicine Wheels" in Southern Alberta and the Adjacent Portion of Montana: Were they Designed as Grave Markers? (*Journal of the Washington Academy of Sciences*, XLIV (5), May, 1954, 133-7). On the basis of information obtained from elderly Blackfoot informants, it is suggested that the arrangement of stones in the form of a wheel (the so-called Medicine Wheels) may have been associated with burials.

- KEITHAHN, EDWARD L. Human Hair as a Decorative Feature in Tlingit Ceremonial Paraphernalia (*Anthropological Papers of the University of Alaska*, III (1), Dec., 1954, 17-20). Although the use of human hair in the decoration of ceremonial objects is a trait of Northwest Coast culture that is not limited to the Tlingit, it appears to be more common among members of that tribe than any other.
- KERR, ROBERT. Rae's Franklin Relics (*The Beaver*, Outfit 284, March, 1954, 25-7). The Royal Scottish Museum in Edinburgh has a small collection of material brought from the Arctic by Dr. John Rae, including a few relics, obtained from the Eskimo, of the Franklin expedition.
- KIDD, KENNETH E. A Note on the Palæopathology of Ontario (*American Journal of Physical Anthropology*, XII (4), Dec., 1954, 610-15). A description of pathological abnormalities found in osteological remains from two prehistoric Indian sites in Ontario.
- Trade Goods Research Techniques (*American Antiquity*, XX (1), July, 1954, 1-8). The growth of interest in historical archaeology has led to an increasing recognition of the value of European trade goods in dating Indian sites of the post-contact period. Accurate dating of European goods, however, is difficult and involves a study of specimens in European folk-museums and other repositories where everyday objects of known periods have been preserved.
- KIMBALL, SOLON T. The New Crisis in Indian Affairs (*The American Indian*, VII (1), spring, 1954, 21-8). A thoughtful and objective study of the probable effects of legislation pending in the United States Congress aimed to emancipate the Indians from Federal control. The author believes that this would be detrimental, while at the same time pointing out the blighting effects of wardship.
- KNUTH, EIGIL. The Paleo-Eskimo Culture of Northeast Greenland Elucidated by Three New Sites (*American Antiquity*, XIX (4), April, 1954, 367-81). Archaeological work in northeast Greenland has disclosed a palæo-Eskimo culture, characterized by a musk-ox hunting people who lived in tents on gravel terraces. The closest affinities of this culture are with western Greenland, but there are also similarities to the Dorset culture of the Canadian Arctic. It is suggested that the climate must have been warmer at the time of this occupancy than at present.
- KURATH, GERTRUDE P. Chippewa Sacred Songs in Religious Metamorphosis (*The Scientific Monthly*, LXXIX (5), Nov., 1954, 311-17). The Ojibwa (Chippewa) Indians of Michigan still use songs which, though usually of Christian origin, include a few native elements. A religious festival in August is attended by many Ojibwa from Ontario.
- Onondaga Ritual Parodies (*Journal of American Folklore*, LXVII (266) Oct.-Dec., 1954, 404-6). A note on parody elements introduced into contemporary Onondaga masked rituals.
- LA FARGE, OLIVER. Freedom, Equality, Brotherhood (*The American Indian*, VII (1), spring, 1954, 4-11). In a trenchant criticism of United States government policy, the author expresses the view that pending legislation will be detrimental to the best interests of the Indians. Though theoretically aimed to give the Indian equality, it is actually a denial of administrative responsibility. The basic problems are similar in Canada, and we have much to learn from experience south of the border.
- The Indian Problem in the United States (*Boletín Indigenista*, XIII (4), Dec. 1953, 338-51). A clear presentation of the author's views on the dangers to the Indians of the United States of pending legislation.
- LANTIS, MARGARET. Nunivak Eskimo Personality as Revealed in the Mythology (*Anthropological Papers of the University of Alaska*, II (1), Dec., 1953, 109-74). An important study of Nunivak Island Eskimo mythology. The author has analysed the themes with regard to the light they shed on personality and included data on their distribution among the Eskimo.
- Opportunities for Sociological Research in Alaska (*American Sociological Review*, XVIII (6), Dec., 1953, 666-9). A description of the opportunities for sociological research in Alaska, with a plea for activity in this field.



- LARSEN, HELGE. The Position of Ipiutak in Eskimo Culture (*American Antiquity*, XX (1), July, 1954, 74-9). In a very scholarly manner, the author reaffirms his opinion regarding the place of Ipiutak in Eskimo culture and refutes the arguments of Collins (q.v.) on this point.
- LAUGHLIN, WILLIAM S., and GORDON H. MARSH. The Lamellar Flake Manufacturing Site on Anangula Island in the Aleutians (*American Antiquity*, XX (1), July, 1954, 27-39). On Anangula Island a work-shop site was discovered, which was devoted almost entirely to the manufacturing of lamellar flakes, presumably later converted into other types of tools.
- LEACOCK, ELEANOR. The Montagnais "Hunting Territory" and the Fur Trade (*American Anthropologist*, LVI (5), Part 2, Memoir 78 (American Anthropological Association, 1954. Pp. xi, 59). A careful study, based both upon field work and a study of the literature, leads to the conclusion that the recognition of hunting areas among the Montagnais-Naskapi of northern Quebec and Labrador was a concept that developed as a result of European influence. The culture of these northern Indians was more strongly modified by early contact than was generally believed.
- LEE, THOMAS E. The First Sheguiandah Expedition, Manitoulin Island, Ontario (*American Antiquity*, XX (2), Oct., 1954, 101-11). This article is the first comprehensive report on the enormous and important pre-ceramic site at Sheguiandah, Manitoulin Island, Ontario. Thousands of quartzite blades and literally tens of thousands of chips indicate that it was a work-shop on a gigantic scale; this is one of the earliest sites in Ontario, as well as one of the most significant locations in eastern America.
- The Giant Site, Manitoulin Island (National Museum of Canada, Bulletin 132, *Annual Report for the Fiscal Year 1952-53*, Ottawa, 1954, 66-71). Two miles from the main Sheguiandah work-shop site, a further one of the same period was discovered. Located at the base of a ridge, it is hoped that future excavation may reveal traces of the culture of the Indians who manufactured the vast numbers of implements on the crest above.
- LEECHMAN, DOUGLAS. A Ceremonial Palette from Saskatchewan (*Canadian Geographical Journal*, XLVIII (3), March, 1954, 126-7). A brief illustrated description of a circular sandstone object, somewhat resembling a palette, found near Saskatoon. It resembles a type of Indian ceremonial object that occurs in the southern United States.
- Eskimo Sculpture in Stone (*Canadian Geographical Journal*, XLIX (3), Sept., 1954, 90-9). Although archaeological work has shown that Eskimo sculpture is an old craft, there has been a great development with new styles in recent years.
- Men of the Woodlands (*North of 55°*, edited by Clifford Wilson, Toronto, Ryerson Press, 1954, 44-55). Most of the Indians living north of the fifty-fifth parallel belong to the Athapaskan linguistic stock. Hunters and collectors, their simple culture has been profoundly affected in the last century, and although their present economic situation is difficult, there are signs of improvement.
- Some Pictographs of Southeastern British Columbia (*Transactions of the Royal Society of Canada*, XLVIII, series III, section 2, June, 1954, 77-86). A description of three groups of Indian rock paintings, probably connected with puberty rituals.
- The Vanta Kutchin (National Museum of Canada, Bulletin 130, Anthropological Series 33). Ottawa: Department of Northern Affairs and National Resources, 1954. Pp. iv, 35. A well illustrated and semi-popular description of the ethnology of the Kutchin of Old Crow village in the Yukon, recorded in a most attractive manner.
- LERMAN, NORMAN H. An Okanagan Winter Dance (*Anthropology in British Columbia*, IV, 1953-54, Victoria, 1954, 35-6). A description of an Okanagan Indian dance, one of the few elements of native culture surviving in this part of southeastern British Columbia.
- LIBBY, W. F. Radiocarbon Dating (*Endeavour*, XIII (49), Jan., 1954, 5-16). The discoverer of the radiocarbon method of dating organic material gives a scholarly summary of the principles involved, with evidence concerning its validity, and a partial list of dates established by this means. Among these are a number of archaeological sites.

- LOWIE, ROBERT H. Indians of the Plains (American Museum of Natural History, *Anthropological Handbook*. I.). New York: McGraw-Hill Book Company, Inc. 1944. Pp. xiii, 223. More than thirty years ago, the American Museum of Natural History issued a series of *Handbooks* on the Indians of various cultural areas. This is the first of a new series. It is attractively printed, lucidly written, and beautifully illustrated. Its scope is to provide an accurate summary of Plains Indian life at the time of European contact with a chapter on problems of present-day adjustment. It is a very satisfactory volume.
- LUCIER, CHARLES. Buckland Eskimo Myths (*Anthropological Papers of the University of Alaska*, II (2), May 1954, 215-33). A series of myths from the Eskimo of the Seward Peninsula, with references to the distribution of the themes in other areas.
- LUSSAGNET, SUZANNE. Bibliographie Américaniste (*Journal de la Société des Américanistes*, XLII, 1953, 433-518). This extensive annual bibliography of publications on the anthropology of America is arranged in its usual pattern, being first divided into subject matter and then subdivided according to locality.
- MCCLELLAN, CATHARINE. The Interrelations of Social Structure with Northern Tlingit Ceremonialism (*Southwestern Journal of Anthropology*, X (1), spring, 1954, 75-96). In all types of ceremonial among the Tlingit, both the activities and the objectives of the individual are controlled by membership in social groups.
- MACKAY, D. M. Indian Affairs Branch (in Canada, Department of Citizenship and Immigration, *Report for the Fiscal Year Ended March 31, 1953*, Ottawa, 1953, 40-85). The function of this annual report is to give a broad picture of government administration in regard to Indians. It contains data on expenditures of various kinds, on the activities of the Indians, and on educational trends, all divided on a provincial basis.
- MACNEISH, JUNE HELM. Contemporary Folk Beliefs of a Slave Indian Band (*Journal of American Folklore*, LXVII (264), April-June, 1954, 185-98). An interesting collection of current folk-beliefs, practices, and tales collected among the Slave Indians of the Northwest Territories.
- MACNEISH, RICHARD S. The Pointed Mountain Site near Fort Liard, Northwest Territories, Canada (*American Antiquity*, XIX (3), Jan., 1954, 234-53). An important archaeological site at Pointed Mountain near Fort Liard, Northwest Territories, was excavated in 1952. The material was found in loess, and is probably 5,000 to 8,000 years old. Microlithic blade tools are characteristic of this site, suggesting the possibility of an ancient horizon extending from Alaska to the eastern part of the Northwest Territories, and perhaps are distantly related to the Palæo-Eskimo culture.
- The Stott Mound and Village, near Brandon, Manitoba (National Museum of Canada, Bulletin 132, *Annual Report for the Fiscal Year 1952-53*, Ottawa, 1954, 20-65). Careful archaeological investigation of a mound and village site in Manitoba reveals that the function of the former was for burials. It belonged to the late prehistoric period. The excavated material is carefully and thoroughly described. On the basis of analysis and comparative studies, it appears that the occupants were ancestors of the Assiniboine; perhaps their discontinuation of mound burials in the historic period was due to their adoption of the horse.
- MANGELSDORF, PAUL C. New Evidence on the Origin and Ancestry of Maize (*American Antiquity*, XIX (4), April, 1954, 409-10). Recent archaeological, botanical, and genetic studies have proved that maize is definitely of American origin. Its development from the ancestral wild form has been surprisingly rapid.
- MARSH, D. B. Enter the Anglican Missionaries (among the Eskimos) (*The Beaver*, Outfit 285, winter, 1954, 31-3). The work of Anglican missionaries in the Arctic began in the last century. It has included teaching the natives the syllabic system of writing, thereby facilitating the use of Eskimo lay readers, the erection of hospitals, and the beginning of education, in addition to the spreading of Christianity.
- MARSH, GORDON H. A Comparative Survey of Eskimo-Aleut Religion (*Anthropological Papers of the University of Alaska*, III (1), Dec., 1954, 21-36). An analytical study of the religious beliefs of the Aleut and the Eskimo shows both resemblances and differences which are of value in tracing contacts and the extent of cultural survival.

- MATHER, JOHN R. The Effect of Climate on the New World Migration of Primitive Man (*Southwestern Journal of Anthropology*, X (3), autumn, 1954, 304-21). A scholarly study of climatic changes in the Bering Sea area, in reference to its implications regarding the period, or periods, when poorly clad individuals could have penetrated this region.
- MATSON, G. ALBIN, ELIZABETH A. KOCH, and PHILIP LEVINE. A Study of the Hereditary Blood Factors among the Chippewa Indians of Minnesota (*American Journal of Physical Anthropology*, XII (3), Sept., 1954, 413-26). A study of gene frequencies among the Ojibwa (Chippewa) Indians of northern Minnesota indicates a correlation with the amount of white intermixture.
- MILNES, HUMPHREY. German Folklore in Ontario (*Journal of American Folklore*, LXVII (263), Jan.-March, 1954, 35-43). Examples are given of the proverbial expressions, songs, and beliefs still current among the German-speaking people of Waterloo County, Ontario, many of whom are of Mennonite ancestry.
- MONET, JACQUES. The Rosary and the Jesuit Missions in New France (*Martyrs' Shrine Message*, XVIII (1), March, 1954, 14-15). Extracts from the *Relations* show the importance of the rosary among the Huron converts in New France.
- MOORE, PERCY E. Health for Indians and Eskimos (*Canadian Geographical Journal*, XLVIII (6), June, 1954, 216-21). An informative summary of government health services for the Indians and Eskimo. In 1953 more than 31,000 patients received hospital care; this represents about one in five of the native population.
- MUÑOZ, JUAN. Cliff Dwellers of the Bering Sea (*National Geographic Magazine*, CV (1), Jan., 1954, 129-43). A semi-popular description, illustrated with beautiful photographs, of the life of the King Island Eskimo during the winter.
- The Native Voice* (VIII (1-12), Jan.-Dec., 1954, monthly). Vancouver: Native Voice Publishing Co., 325 Standard Building. This newspaper, published by Indians for Indians, continues its policy of recording items of interest about the Indians. In so doing, it provides important data on changing attitudes and interests.
- NESBITT, JAMES K. Potlatch in the Park (*The Beaver*, Outfit 284, March, 1954, 8-11). A house-warming, in the form of a potlatch, was held recently in the Kwakiutl house erected in Thunderbird Park, Victoria.
- NETTL, BRUNO. North American Indian Musical Styles (*Journal of American Folklore*, LXVII (263), Jan.-March, 1954, 44-56; LXVII (265), July-Sept., 1954, 297-307; LXVII (266), Oct.-Dec., 1954, 351-68). This is a scholarly and important analysis of musical styles among the Indians of North America. Basing his results on styles alone, irrespective either of their complexity or the musical instruments employed, the author distinguishes six musical areas, which show a certain correspondence to culture areas.
- NEUMANN, GEORG K. Archaeology and Race in the American Indian (*Yearbook of Physical Anthropology*, 1952, VIII, Wenner-Gren Foundation for Anthropological Research, Inc., New York, 1954, 213-42). An important summary of knowledge concerning American Indian variations, and their correlations with Archaeological horizons, reprinted from *Archeology of Eastern United States*, edited by James B. Griffin, Chicago, 1952, 13-34. As a supplement, the *Yearbook* includes (243-55) Neumann's tables of measurements of the principal groups.
- NICHOLS, FRANCES S. Index to Schoolcraft's "Indian Tribes of the United States" (Smithsonian Institution, Bureau of American Ethnology, Bulletin 152). Washington: United States Government Printing Office, 1954. Pp. vi, 257. Between 1851 and 1857 the United States Office of Indian Affairs published six voluminous volumes by Schoolcraft. They were virtually an encyclopaedia of the Indians of North America, based in part on the author's own researches, in part on extensive correspondence with others. Though severely criticized for certain factual errors and bias, "The Indian Tribes" provide valuable source material. This monumental index facilitates their use.
- NICHOLS, PETER A. C. Boat-building Eskimos (*The Beaver*, Outfit 285, summer, 1954, 52-3). As a project to help the Eskimo to help themselves, a shipwright has been employed by the government to teach a selected group of Eskimo at Lake Harbour to build whaleboats.

- Enter the Fur Traders (among the Eskimos) (*The Beaver*, Outfit 285, winter, 1954, 37-8). Long resident in the Arctic, and knowing individual Eskimo personally, the fur trader has frequently been the ambassador of European culture. Changes are inevitable, but it has been the rôle of the trader to ease the hardships of Eskimo life with modern equipment.
- Northern Administration and Lands Branch (in Canada, Department of Resources and Development, *Report for the Fiscal Year Ended March 31, 1953*, Ottawa, 1953, 63-96). Included in this summary of government activities in the Northwest Territories and the Yukon is an outline of educational and economic work among the Eskimo.
- O'BRIEN, GERALD. Kateri Tekakwitha (*Martyrs' Shrine Message*, XVIII (4), Dec., 1954, 108-9; 114). Kateri Tekakwitha was a 17th century Iroquois girl of intense religious devotion who, the author hopes, may be beatified.
- OLSON, RONALD L. Social Life of the Owikeno Kwakiutl (*Anthropological Records*, XIV (3), 1954, 209-59). The Wakashan-speaking people of Rivers Inlet, often referred to as a branch of the mainland Kwakiutl, are among the least known of the northwest coast tribes. Their culture disintegrated before any significant effort was made to record it. Olson has collected what information was available and has presented it in the best anthropological manner. The paucity of the data obtained is a measure of the virtual disappearance of Owikeno culture. The facts are, therefore, of particular value and, though meagre, help to fill gaps in our knowledge of the distribution of northwest coast traits.
- OSWALT, WENDELL. Northeast Asian and Alaskan Pottery Relationships (*Southwestern Journal of Anthropology*, IX (4), winter, 1953, 395-407). The distinctive pottery of the Bristol Bay-Norton Sound region of Alaska is relatively recent and appears to be genetically related to pottery of Japan, Kamchatka, and the Kurile Islands.
- Recent Pottery from the Bering Strait Region (*Anthropological Papers of the University of Alaska*, II (1), Dec., 1953, 5-18). An analysis of Western Eskimo pottery, with reference to form, technique, and decoration, with discussion of evidence concerning culture spread.
- Regional Chronologies in Spruce of the Kuskokwim River, Alaska (*Anthropological Papers of the University of Alaska*, II (2), May, 1954, 203-14). A study of some of the problems of dendrochronology in Alaska.
- PEACOCK, KENNETH. Nine Songs from Newfoundland (*Journal of American Folklore*, LXVII (264), April-June, 1954, 123-36). Nine folksongs of European origin are recorded from Newfoundland, with an analysis of the musical form.
- PEARCE, ROY H. *The Savages of America*. Baltimore: John Hopkins Press. 1953. Pp. 252. This is a sensitive, literary study of American attitudes towards the Indians from the Colonial period onwards. The tendency to vilification of the Indians is attributed to an unconscious attempt to justify their gradual elimination from their native land and the development of a system of wardship.
- POHL, FREDERICK J. Plaster under the Newport Tower (*American Antiquity*, XIX (3), Jan., 1954, 275-7). A strong criticism of the views expressed by Godfrey (q.v.) on the antiquity of the Newport Tower. The author does not believe that Godfrey has proved the tower to have been erected in Colonial times.
- POPHAM, ROBERT E. Trepanation as a Rational Procedure in Primitive Surgery (*University of Toronto Medical Journal*, XXXI (5), Feb., 1954, 204-11). A scholarly study of trepanation among primitive peoples; the practice was known among the prehistoric Indians of southern Ontario and of British Columbia.
- POPHAM, ROBERT E., and J. N. EMERSON. Manifestations of the Old Copper Industry in Ontario (*Pennsylvania Archaeologist*, XXIV (1), May, 1954, 3-19). A careful study of the typology and distribution of copper implements in Ontario, based on specimens in the Royal Ontario Museum, together with a detailed report of a cache recovered at Farquar Lake in Haliburton District. The article is, accordingly, a combination of comparative work and original field archæology.
- PROVINCE, JOHN, *et al.* Wenner-Gren Foundation Supper Conference: The American Indian in Transition (*American Anthropologist*, LVI (3), June, 1954, 387-94). The opinion expressed by a number of anthropologists called together to discuss current problems of the American Indians, was that most tribes would retain many of their cultural characteristics and would likely continue to form islands of cultural specialization for an indefinite period.

- QUIMBY, GEORGE I. The Old Copper Assemblage and\* Extinct Animals (*American Antiquity*, XX (2), Oct., 1954, 169-170). There is some evidence to suggest the contemporaneity of copper tools with extinct mammals in Ontario.
- Rae on the Eskimos (*The Beaver*, Outfit 284, March, 1954, 38-41). In 1882 Dr. John Rae, the celebrated Arctic explorer, delivered a lecture in London on Indians and Eskimo whom he had met in his travels. Extracts from his paper give a vivid picture of the Eskimo before the disruption of native life.
- RAY, VERNE F., and NANCY OESTREICH LURIE. The Contributions of Lewis and Clark to Ethnography (*Journal of the Washington Academy of Sciences*, XLIV (11), Nov., 1954, 358-70). This thorough appraisal of the significance of the ethnological data collected by the Lewis and Clark expedition is of value in any study of the Indian tribes of Oregon and Washington, and of marginal importance in regard to tribal distributions in southern British Columbia.
- RIDLEY, FRANK. The Frank Bay Site, Lake Nipissing, Ontario (*American Antiquity*, XX (1), July, 1954, 40-50). This important article gives a detailed archaeological description of a stratified site on Lake Nipissing, Ontario. The favourable location has led to successive occupancies, extending from an early Mattawan stratum, through Point Peninsula, Barrie-Uren and Lalonde, to the contact period.
- RIOUX, MARCEL. Anthropology and Folklore (National Museum of Canada, Bulletin 132, *Annual Report for the Fiscal Year 1952-53*, Ottawa, 1954, 72-6). A thoughtful appraisal of the relationship between the fields and the techniques of anthropology and folklore.
- Un bilan de l'anthropologie contemporaine (*Revue de Psychologie des Peuples*, 1954, 73-85). An appraisal of the place of anthropology in the modern world, based particularly on the conclusions of a symposium held under the auspices of the Wenner-Gren Foundation.
- Description de la Culture de l'Ile Verte (Musée National du Canada, Bulletin 133, série anthropologique 35). Ottawa: Ministère du Nord Canadien et des Ressources Nationales. 1954. Pp. iii, 98. In this study of Ile Verte, an island in the St. Lawrence, the author uses an ethnological approach. After a summary of the history of the island and its inhabitants, he describes the way of life, including economic pursuits, houses, property, social life, and comments on folklore and songs. It is a very useful factual record of a contemporary French-Canadian community.
- Sociabilité et Typologie sociale (*Contributions à l'Etude des Sciences de l'Homme*, II, Montréal, 1953, 61-73). A series of observations, of a sociological nature, upon social conditions and changes in a French-Canadian village on the Bay of Chaleur.
- ROUSSEAU, JACQUES. La Religion Primitive des Montagnais et des Hurons (*Proceedings of the Thirtieth Congress of Americanists*, Cambridge, 1952, London, n.d., 151-54). A clear and valuable summary of the religious beliefs of the Naskapi (Montagnais) of northern Quebec, with comments on similar concepts recorded in early writings on the Hurons.
- Rites païens de la forêt québécoise: la tente tremblante et la suerie (*Les Cahiers des Dix*, XVIII, 1953, 129-55). Based on extensive ethnological investigations, the author describes in considerable detail two of the important rituals of the Montagnais-Naskapi, namely, the shaking-tent and the sweat-bath.
- RUSSELL, CHARLES. Indian Arts in Tomorrow's America (*The American Indian*, VII (1), spring, 1954, 29-36). A thoughtful statement of the value of Indian arts and crafts in American life. Although written with particular reference to the United States, the principles are equally applicable in Canada.
- SANDERS, IRWIN T., et al. Societies around the World. New York; Dryden Press. 1953. Vol. I, pp. xii, 528; vol. II, pp. xii, 608. One of the six societies chosen for a general description, suitable for university use, is that of the Eskimo.
- SCHIFTER, RICHARD. Indian Title to Land (*The American Indian*, VII (1), spring 1954, 37-47). A broad study of legislation regarding Indian ownership of land in the United States. It brings out a number of important points regarding the diverse attitudes of Indians and white administrators in regard to the basic concepts of ownership and is, accordingly, of relevance in Canada.



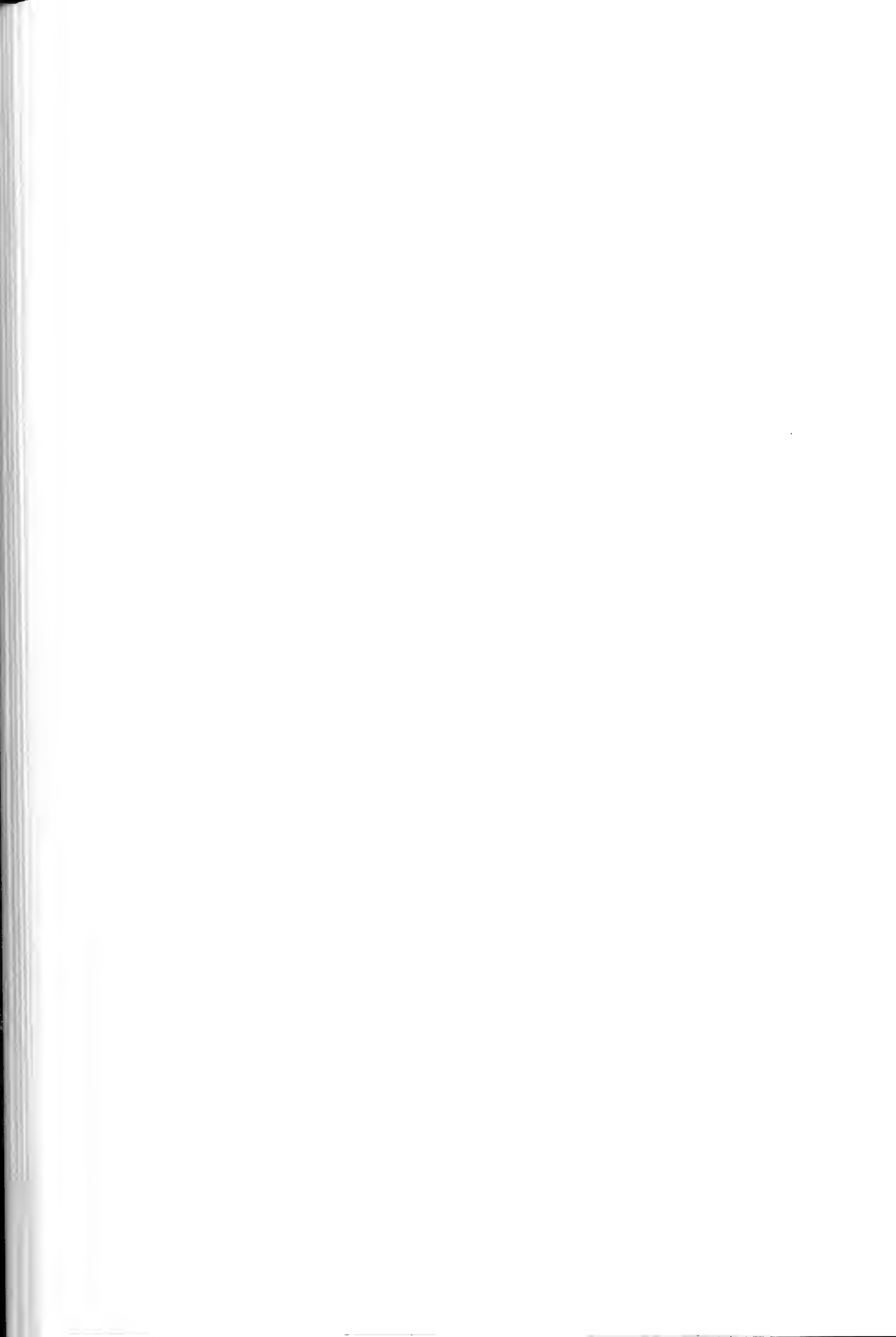
- SHAW, AVERY. A Micmac Glengarry (New Brunswick Museum Art Department, *Art Bulletin*, II (3), autumn, 1954, 3-4). A brief description of a Glengarry bonnet, of Micmac manufacture, decorated with beadwork.
- SHIPPEN, HERBERT H. A Woven Bulrush Mat from an Indian Tribe of the Great Lakes Region (*Papers of the Michigan Academy of Science, Arts, and Letters*, XXXIX, (1953 Meeting), 1954, Ann Arbor, University of Michigan Press, 399-406). An analysis of the materials used and the techniques employed in the manufacture of a cat-tail mat. The specimen, of unusual size and beauty, was collected many years ago; it was probably made by the Ojibwa of the Minnesota-Ontario region.
- SMITH, MARIAN W. Attributes and the Discovery of Projectile Point Types: with Data from the Columbia-Fraser Region (*American Antiquity*, XX (1), July, 1954, 15-26). After pointing out the need for a precise terminology for describing projectile points, the author illustrates this by comparing artifacts of this category from the region of the Columbia and Fraser rivers.
- Shamanism in the Shaker Religion of Northwest America (*Man*, LIV, Aug., 1954, 119-22). Although the native Shaker sect of northern Washington and southern British Columbia is avowedly Christian, elements of shamanism, derived from Indian religion, occurs in its practices.
- SNYDERMAN, GEORGE S. The Functions of Wampum (*Proceedings of the American Philosophical Society*, XCVIII (6), Dec. 23, 1954, 469-94). This important study deals with the functions of wampum among the eastern Indians. The author cites copious extracts from historical sources to show how it was used as a sort of ceremonial pledge in inter-tribal relations.
- SPENCER, ROBERT F., and W. K. CARTER. The Blind Man and the Loon Barrow Eskimo Variants (*Journal of American Folklore*, LXVII (263), Jan.-March, 1954, 65-72). The authors analyse a widespread Eskimo legend, noting the absence or presence of certain elements in different areas and discussing particularly versions that are current in Alaska.
- STEWART, ETHEL. Early days at Fort McPherson (*The Beaver*, Outfit 285, winter, 1954, 39-41). A few incidents connected with the establishment of Fort McPherson in 1840 are still related by some of the older Loucheux Indian women.
- SUTTLES, WAYNE. Notes on Coast Salish Sea-Mammal Hunting (*Anthropology in British Columbia*, III, 1952, Victoria, 1953, 10-20). The hunting of sea-lions, once practised by several of the West Coast tribes, is still remembered by the Penelekuts of Kuper Island and its vicinity in Georgia Strait. The author describes hunting techniques and associated social rituals, including formal rules for the division of the quarry. He considers the possibility of this trait being related to an ancient culture that included the Eskimo as well as parts of the Northwest Coast.
- SWADESH, MORRIS. Symposium: Time Depths of American Linguistic Groupings (*American Anthropologist*, LVI (3), June, 1954, 361-77). Using the techniques of glottochronology, essentially the percentage of agreement in non-cultural vocabulary, the author estimates the age of separation of various American Indian languages and stocks. His findings are discussed by a number of archaeologists, the comments of Henry B. Collins on the age of separation of Eskimo and Aleut being particularly relevant in Canada.
- TAYLOR, HERBERT C., JR., and WARREN CALDWELL. Carved Atlatl from Northwest Coast (*American Antiquity*, XIX (3), Jan., 1954, 279-80). A brief description of a wooden spear-thrower dredged from the strait of Georgia. Since the designs are not characteristic of Northwest Coast art, the provenance of the specimen is problematical.
- TEICHER, MORTON I. Three Cases of Psychosis among the Eskimos (*The Journal of Mental Science*, C (419), April, 1954, 527-35). Case histories of three Eskimo from Southampton Island, studied in the field and later in the mental hospitals in Manitoba to which the patients were sent, reveal a type of psychosis similar to that in our own society. Though the content of each illness differed from what would be characteristic of schizophrenia in a white community, the structure and process of the disease was essentially the same.

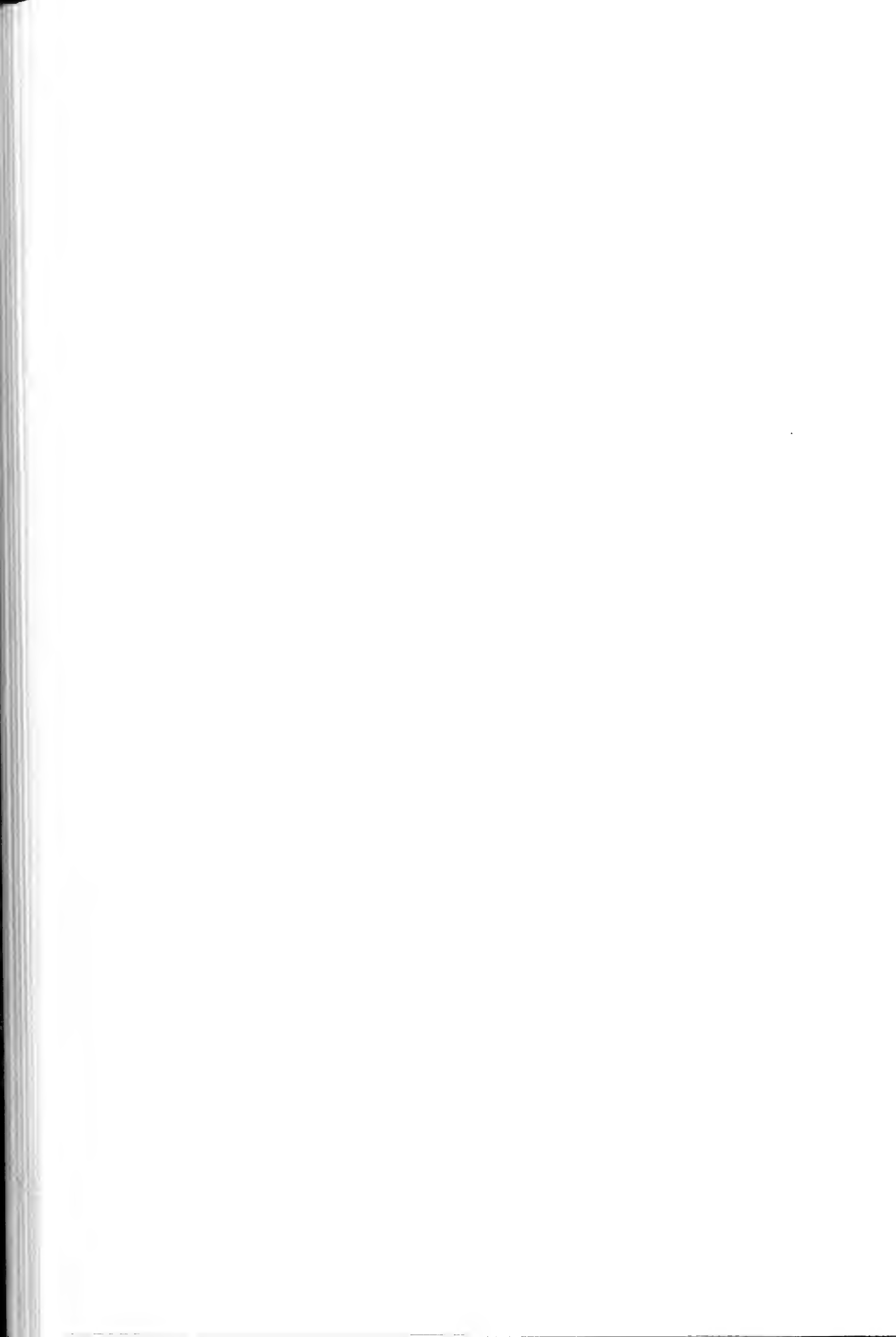


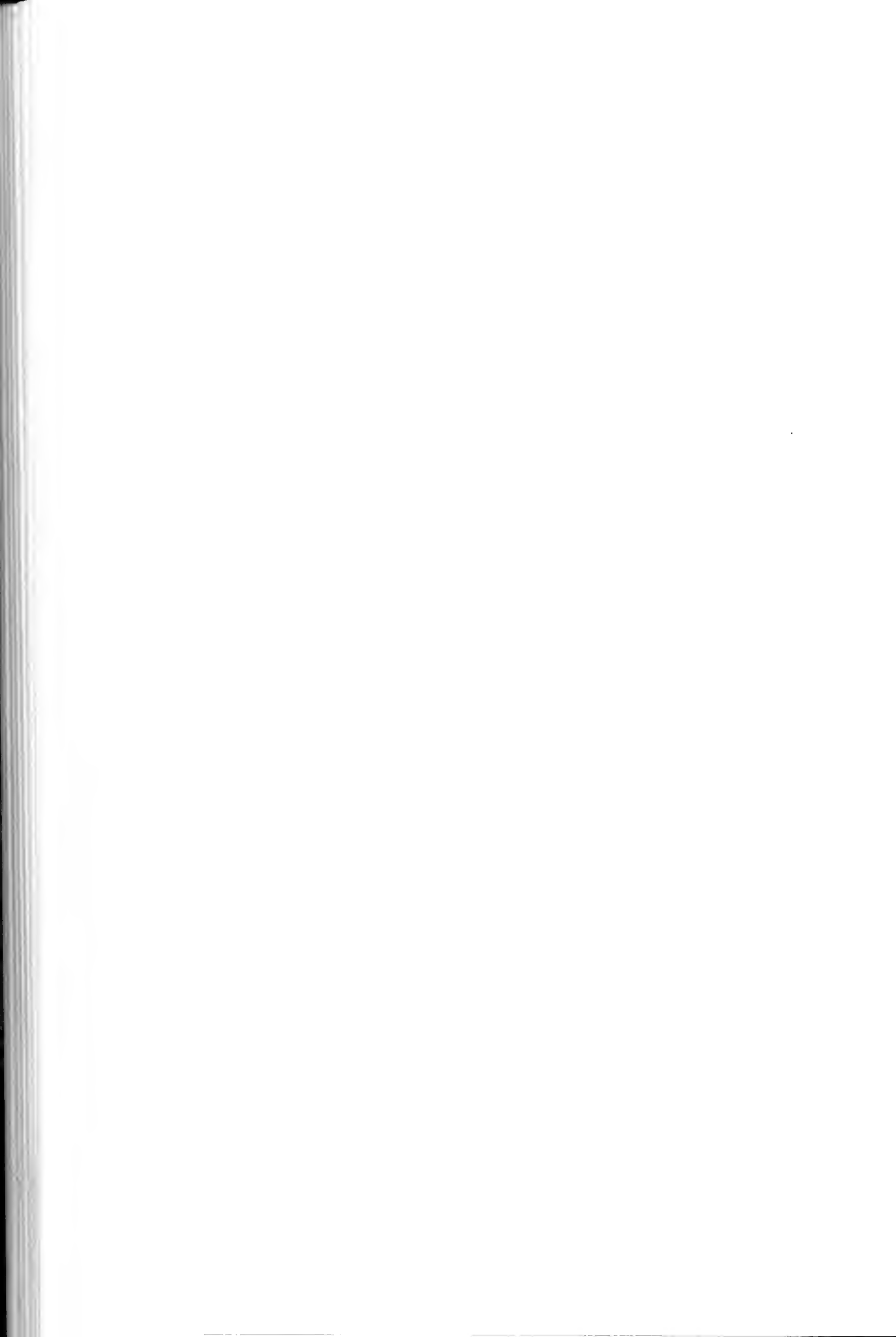
- The 1951 Census in the Northwest Territories (*Arctic*, VII (1), June, 1954, 52-5). Reprinted from the *Arctic Circular* (VI, 1953, 37-42), this article analyses a recent census of the Eskimo and comments on its accuracy in relationship to earlier figures.
- THIBERT, ARTHUR. Dictionary: English-Eskimo: Eskimo-English. Ottawa; University of Ottawa, Research Centre of Amerindian Anthropology. 1954. Pp. X, 171. This dictionary is the product of twenty-seven years of missionary work in the Arctic. The words are arranged alphabetically in English-Eskimo and Eskimo-English, followed by brief appendices on certain grammatical processes.
- Enter the Roman Catholic Missionaries (among the Eskimos) (*The Beaver*, Outfit 285, winter, 1954, 34-6). The author gives a number of graphic examples of the beneficial effects of the work of Roman Catholic missionaries among the Eskimo.
- VALENTINE, V. F. Some Problems of the Métis of Northern Saskatchewan (*The Canadian Journal of Economics and Political Science*, XX (1), Feb., 1954, 89-95). This is an important analysis, made by a social anthropologist, of problems of adjustment facing the Métis of northern Saskatchewan. Decline in the fur-trade, combined with an increasing population, is resulting in significant culture change; government assistance is not fully understood, and the result is a series of difficulties.
- VANSTONE, JAMES W. Carved Human Figures from St. Lawrence Island, Alaska (*Anthropological Paper of the University of Alaska*, II (1), Dec., 1953, 19-29). A description of Eskimo sculpture in wood, stone, and ivory from St. Lawrence Island. The themes appear to be idiosyncratic to the area, although the art styles show certain resemblances to Siberian and East Greenland forms.
- Pottery from Nunivak Island, Alaska (*Anthropological Papers of the University of Alaska*, II (2), May, 1954, 181-93). Analysis and comparison of Eskimo pottery from Nunivak Island show resemblance to, and differences from, ceramics from other Eskimo areas.
- WALLIS, RUTH SAWTELL. The Overt Fears of Dakota Indian Children (*Child Development*, XXV (3), Sept., 1954, 185-92). Fears experienced by Dakota children in Manitoba and Minnesota do not differ significantly from those of rural white children, although certain facets are present from their aboriginal culture.
- WALLIS, RUTH SAWTELL, and WILSON D. WALLIS. The Sins of the Fathers: Concept of Disease among the Canadian Dakota (*Southwestern Journal of Anthropology*, IX (4), winter, 1953, 431-5). The concept of sickness caused by an ancestor's sin is deeply rooted among the northern Dakota of southern Manitoba.
- WEATHERWAX, PAUL. Indian Corn in Old America. New York: The Macmillan Company. 1944. Pp. ix, 253. This is an attractive volume, both in text and illustrations, giving an admirable summary of the distribution and uses of corn among the Indians of America. The author discusses in considerable detail the vexed question of its origin, and includes an extensive bibliography.
- WHEELER, E. P., 2ND. List of Labrador Eskimo Place Names. (*National Museum of Canada, Bulletin 131, Anthropological Series 34*). Ottawa: Department of Resources and Development. 1953. Pp. iv, 105. This volume comprises a list of 523 Eskimo place names from Labrador. The geographical location of each is given, together with a translation of the native term and comments on the implications involved. Prepared by a geologist with a deep interest in the Eskimo, the list has been checked by Moravian missionaries familiar with the language.
- WHITAKER, IAN. The Scottish Kayaks and the 'Finn-men' (*Antiquity*, XXVIII (110), June, 1954, 99-104). Five, if not six, Eskimo kayaks, each with a single occupant, reached the coast of Scotland in the seventeenth and eighteenth centuries. One of the kayaks was beached and is preserved in Aberdeen; they are of the Greenland type. The provenance of the others is unknown, nor is it known how it was possible for the craft to withstand the long journey from Greenland, even allowing for stops at Iceland and the Faroes. The possibility of the craft being of European origin is considered but regarded as untenable.

- WHITE, THAIN. Scarred Trees in Western Montana (Montana State University, *Anthropology and Sociology Papers*, No. 17, 1954. Pp. 15). Particularly in spring, the Kutenai Indians frequently stripped bark from a variety of trees to eat the sweetish inner layer or cambium. Although the practice has passed away, many trees still show scars from peeling for this purpose.
- WICKHAM, JOHN. Father Jerome Lalement at Allumette Island (*Martyrs' Shrine Message*, XVIII (3), Oct., 1954, 89-91). An incident, vividly described, illustrating the dangers experienced by one of the Jesuit Fathers in the 17th century.
- WILKINSON, DOUG. How I became an Eskimo (*Macleans Magazine*, LXVII (22), Nov. 15, 1954, 28-30; 103-9). This is a vivid description of Eskimo life, as seen and experienced by a white man who lived, as an adopted son, with an Eskimo family in North Baffin Island.
- WISE, S. F. The Indian Diplomacy of John Graves Simcoe (*The Canadian Historical Association, Report of the Annual Meeting, June 4-6, 1953*, (n.d.) 36-44). A historical analysis of the unsuccessful, and perhaps unwise, efforts of Governor Simcoe to mediate between the Indians of the Ohio region and the American government during the turbulent years of 1792 to 1794.





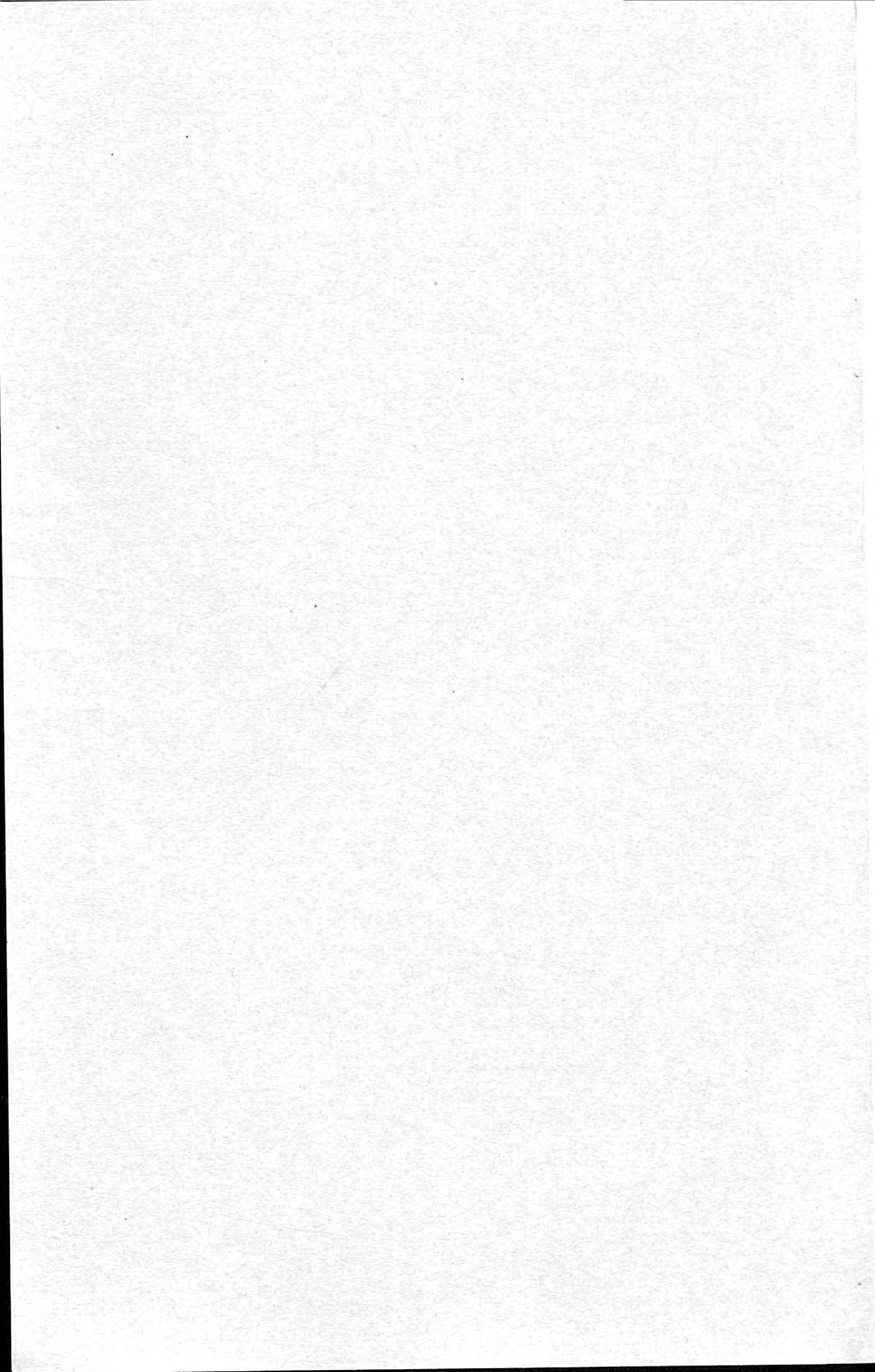












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